THE INDUSTRY'S RECOGNIZED AUTHORITY

# ROCK PRODUCTS

JULY 1952

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

Working high bank gravel deposit in Utah

Cross section of Roller Mill showing how material is ground by rolls rotating against bull ring, then air swept to separator which extracts fines and returns coarse material to mill for regrinding.

#### OTHER WILLIAMS EQUIPMENT

HAMMER MILLS

"Super-Slugger" models, with capacities up to 550 tons per hour, that reduce power shovel loaded rock to 11/2", 3/4" or agstone in one operation.

"Slugger" models, with capacities up to 100 tons per hour, that reduce "one-man" size stone to 1¼", ¾" or agricultural limestone in one operation.

Other models, with capacities from 5 to 200 tons per hour, for reducing 4" to 6" stone to  $\frac{1}{2}$ ",  $\frac{1}{2}$ " or agricultural timestone in one operation.

IMPACT and DRIER MILLS AIR SEPARATORS VIBRATING SCREENS

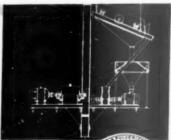
WILLIAMS PATENT CRUSHER & PULVERIZER CO. 800 ST. LOUIS AVE. de

#### Increase Your Output Of FINE GRINDING

...with greater uniformity ... at lower cost

#### PLANTS

Backed by years of know-how and experience, Williams can build any type of readyto-install plant to handle crushing, grinding, air separation, sifting, conveying and magnetic separation including storage bins and electrical equipment.



OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

No ONE chain serves every purpose

# LINK-BELT offers a SPECIFIC chain ... to match your SPECIALIZED needs

# WY ES



TYPICAL CHAINS from the COMPLETE LINK-BELT



Class SS bushed coller chain with offset sidebars —for heavy drive service at moderate speeds.



Class SS bushed roller chain with straight sidebars—for practically any conveying or elevating service.



Class 800 ley bushed chain for heavy duty, severely abrasive conveying



Class C combination chain-popular, durable, low cost design for eleva-

LINK-BELT COMPANY—Plants: Chicago, Indianapolis, Philadelphia, Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia).

Sales Offices in Principal Cities. 12,288-8

LINK- BELT

CHAINS AND SPROCKETS



...with greater uniformity
...at lower cost

## WILLIAMS Roller Mills

Limestone, burned and hydrated lime, clays, kaolin, talc, gypsum — whatever the material, if it has to be finely ground, there's a Williams Roller Mill to do it — faster, for stepped up production — more accurately and uniformly—and at far less cost!

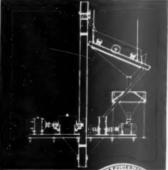
Automatic and continuous in operation, the Williams also dries and grinds simultaneously. Instantly adjustable for finenesses of 20 to 400 mesh, even down to micron sizes. No built-up cushions of "fines" can impair grinding efficiency because the constant upward air current carries ground materials to the air separator which discharges all finished materials and returns only the oversize product to the mill for further grinding.

Feeding rate is automatic and self-adjusting, positive and simple in action—Anti-friction roller and ball bearings reduce down-time for lubrication, save oil and put more power into grinding—Take-up for wear is continuous and automatic—Rugged forgings, electric steel and alloy castings guard against wear and breakdowns—These and many other outstanding features have made Williams Roller Mills the standard for fine-grinding operations.

Write For Catalog

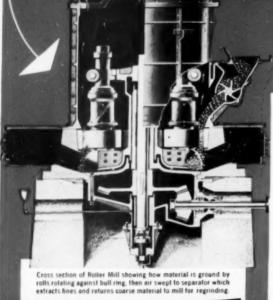
#### WILLIAMS COMPLETE PLANTS

Backed by years of know-how and experience, Williams can build any type of readyto-install plant to handle crushing, grinding, air separation, sifting, conveying and magnetic separation including storage bins and electrical equipment.





OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD



many the second

#### OTHER WILLIAMS EQUIPMENT

"Super-Slugger" models, with capacities up to 550 tons per hour, that reduce power shovel loaded rock to 1½",

%" or agstone in one operation.

"Slugger" models, with capacities up to 100 tons per hour, that reduce "one-man" size stone to 1¼", ¼" or agricultural limestone in one operation.

agricultural limestone in one operation. Other models, with capacities from 5 to 200 tons per hour, Other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 to 200 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other models, with capacities from 5 tons per hour, other

IMPACT and DRIER MILLS AIR SEPARATORS VIBRATING SCREENS

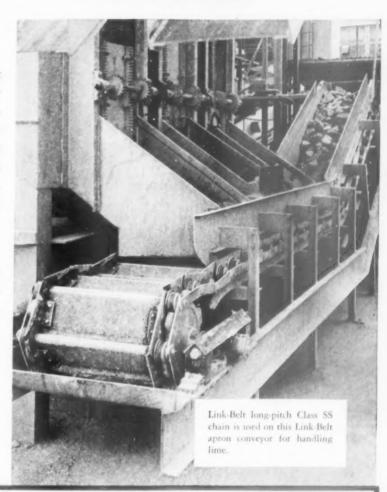
WILLIAMS PATENT CRUSHER & PULVERIZER CO.

# LINK-BELT offers a SPECIFIC chain ... to match your SPECIALIZED needs

There's just *one* type of chain that *best* meets the requirements of any given job. And no "general purpose" chain can do it as well. From our complete chain line, Link-Belt engineers can recommend the *right* chain for your requirements. There's no necessity to fit your needs to a limited line.

#### Get longer life!

Remember, too — when you see a chain with the Link-Belt trade
mark, you can be sure it's made to the highest standards. Link-Belt's modern plant facilities assure greater refinements of manufacture. Accurate control of materials and processes give increased uniformity . . . longer chain life.



TYPICAL CHAINS from the COMPLETE LINK-BELT



Class SS bushed roller chain with offset sidebars —for heavy drive service at moderate speeds.



Class SS bushed roller chain with straight sidebars -for practically any conveying or elevating service.



Class 800 lev bushed chain for heavy duty, severely abrasive conveying



Class C combination chain—popular, durable, low cost design for eleva-

LINK-BELT COMPANY—Plants: Chicago, Indianapolis, Philadelphia, Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia).
Sales Offices in Principal Cities. 12.206-8



CHAINS AND SPROCKETS



#### JULY, 1952

#### ROCK PRODUCTS



THE INDUSTRY'S RECOGNIZED AUTHORITY

VOL. 55, No. 7

**Bror Nordberg** 

Editor

Nathan C. Rockwood **Editorial Consultant** 

This Month	
We Hear	33
Editorial—Price Controls the Cause of Greatest Confusion	37
Rocky's Notes—"Structural Chemistry of Inorganic	
Compounds"	39
Labor Relations Trends	41
People in the News	43
Industry News	47
Hints and Helps	50
New Machinery	52
Combining Economics of Dredge and Belt Conveyor Transportation	54
Fordyce Gravel Co. uses dewatering elevator in transferring material from pump sump to field belt conveyor. Novel floating conveyor simplifies disposal of overburden	
Walter B. Lenhart	
"Prospective" Chemistry of Cement and Concrete Part I. Some of the chemical elements involved Nathan C. Rockwood	57
Heavy-Media Separation Used in Processing Refractory	
Materials  Basic Refractories, Inc., utilizes sink-float process at	60
Gabbs, Nev., operation  Walter B. Lenhart	
Speeding Up Quarry Operations Columbia Quarry Co. adds large trucks and uses dry- operated rotary drills at Columbia, Ill., plant	63
Crushing Practice and Theory Part VIII. Crushing rolls and their use	65
Gravel Aggregate for Folian Dam	69
Gravel Aggregate for Falcon Dam  United States and Mexico build international dam on Rio Grande. Concrete design varies between coun- tries. Three sizes of coarse aggregate produced and pozzolanic materials used extensively  Walter S. Lenhart	69
Producing Aggregates for Atomic Energy Construction	
Project	74
Phosphate Resources in the Pacific	76
Francis J. Knight	
Industrial Sand Producers Discuss Industry Problems  Seventeenth annual meeting emphasizes government regulations, employer-employe relations and technical discussion	77
Flexible Small Crushed Stone Plant	82
Merchandising Ideas Highlight N.A.L.I. Summer Meeting Chicago meeting also covered conservation appro- priations, percentage depletion and functions of lim-	83
Pipe Manufacture in The Netherlands	121
Design and production methods vary widely from U.S. practice	
P. F. van der Meulen Bosma	
Large Precast Structural Concrete Arches	126
Ready-Mixed Concrete for Highway Paving C-J Ready Mixed Concrete's central mixing plant designed in anticipation of developing highway busi-	130
ness in southern Illinois	
L. David Minsk Making Concrete Masonry Units for H-Bomb Project	134

Walter B. Lenhart, Associate Editor L. Dovid Minsk, Associate Editor Robert E. Wilde, Associate Editor M. K. Smith, Assistant Editor E. M. Amacher, Assistant Editor

#### **Contributing Editors**

Victor J. Azbe F. O. Anderegg M. W. Loving James A. Barr, Jr.

#### Home Office

E. R. Gauley, Manager Mary A. Whalen, Subscription Dir. M. Z. Poplett, Dir. of Research C. M. Hancock, Production Manager C. P. Teats, Field Representative

#### District Offices

Eastern Area-Morgan K. Cotting-ham, Manager; Raymond E. Keine, Assistant, 522 Fifth Ave., New York 36, Tel. Murray Hill 2-7888.

Central Area-R. P. Keine, Manager, Hanna Bldg., Cleveland 15, Tel. Main 1-4362

Midwest Area-E. H. Hickey, Representative, 309 W. Jackson Blvd., Chicago 6, Tel. Harrison 7-7890.

Western Area-L. C. Thaon, Manager, 309 West Jackson Blvd., Chicago 6, Tel. Harrison 7-7890.

Pacific Area-Duncan Scott & Co., Mills Bldg., San Francisco 4, Tel. Garfield 1-7950. In Los Angeles 5, 2978 Wilshire Blvd., Tel. Dunkirk 8-4151

tondon, England-Harold F. Charles, Managing Director, Maclean-Hun-ter, Ltd., Wellington House, 125 Strand, London, W.C. 2.

ROCK PRODUCTS is published monthly by MAC-LEAN-HUNTER Publishing Corporation, 309 West Jackson Blvd., Chicage 6, Illinois; Horace T. Hunter, President; E. R. Gauley, Vice-President; Ralph K. Davis, Secretary, Copyright, 1952, En-tered as second-class matter, Jan. 30, 1936, at the Chicage, III, post office under the act of Mar. 3, 1879, Additional entry at Long Prairie, Minn. ROCK PRODUCTS is indexed regularly by Engi-neering Index, Inc. and the Industrial Arts Index.

SUBSCRIPTION INFORMATION

SUBSCRIPTION INFORMATION
Subscription Price: United States and Possessions,
Canada one year, \$2.00; twa years, \$3.00; three
years, \$4.00. Twa American, one year, \$4.00; two
years, \$7.00; three years, \$10.00. All other foreign
one year, \$6.00; two years, \$12.00; three years,
\$15.00. Twently-five cents for single copies. Canadian subscriptions and remittances may be sent in
Canadian Indus to ROCK PRODUCTS, P. O. Box
100, Terminal "A." Torente, Canada.
To Subscribers—Date on wrapper indicates issue
with which your subscription expires. . . In writing
to have address changed, give old as well as new
address.

# Only B. F. Goodrich makes the grommet belts that cut costs 20 to 50%!

#### Save 3 ways! Investigate today! Write or mail coupon

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

#### What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord *section* as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

#### All cords put to work

Each of the two grommets and every part of a grommet carry their share of the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

#### Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ½ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

#### Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases: "... within a few days ordinary belts had stretched ... After six months of 24-hour-aday service BFG grommet belts haven't stretched at all ..."

"Ordinary belts lasted only 5 or 6 weeks . . . B. F. Goodrich grommet belts are in their sixth month of service . . ."

"Previous belts suffered from shock loads, wore out fast . . . BFG grommet belts have been in service 2 years with no shut-downs . . ."

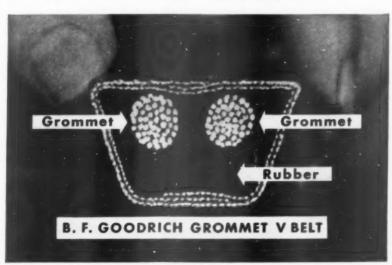
There are hundreds of cases like these.

#### They cost no more

BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,233,294).

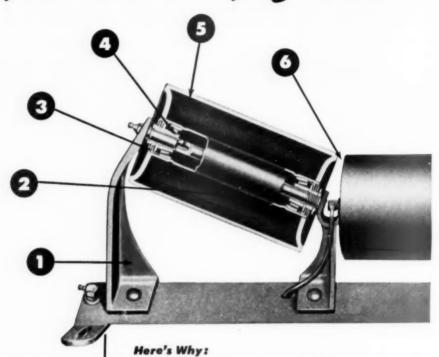
Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)





The B. F. Goodrich Compar Dept. RP-7 Akron, Ohio	,
Send set of reports tell periences and showing a tions proving that B. grommet belts outlast at	F. Goodrich
Have distributor show m belt that shows how B. grommet belts are made	F. Goodrich
Name	
Firm Name	
Street Address	
City	
State	

#### make sure you get full value for your belt conveying dollar



When you're figuring the cost of moving material by belt conveyor, it's important to remember that the belt idler, more than any other item of equipment, determines how low the ultimate cost per ton of material handled will be. Power consumption, belt life, maintenance costs, steady production flow, are all largely dependent on the ability of the idlers to keep rolling.

To make sure you get the most for your belt conveying dollars, you'll find it pays to standardize on Rex® Belt Conveyor Idlers.

- The supporting brackets are unbreakable in normal operation.
   They remain rigidly tight and will stand abnormal usage without breaking.
- 2. The bearing mountings maintain positive bearing alignment under all conditions.
- Rex Idlers have positive and permanent bearing protection against dust and dirt, and require minimum service attention . . . once every 1000 hours in normal operation.
- Rex Idlers have high grade, precision, antifriction bearings with ample radial and thrust load capacity. This means lowest power consumption under all conditions.
- The roll shells are of permanent unit construction with no joints to loosen or corrode. No replacements until idler is completely worn out.
- The idler rolls are smooth and concentric and spaced in the idler assembly to protect the underside of the belt. The roll units are interchangeable for easy servicing.

If your idlers have all these features, you're getting the most for your idler dollar . . . you're using Rex Idlers. If you're using any other idler, it can't possibly have all these outstanding features . . . you can't be getting lowest possible cost per ton handled on your belt conveyor.

So, if you haven't yet standardized on Rex Idlers, call your nearest Chain Belt Field Sales Engineer. He'll give you all the details. Or, if you prefer, write for Bulletin 51-81. Chain Belt Co., 4649 W. Greenfield Ave., Milwaukee 1, Wis.



#### Chain Belt COMPANY

Atlanta • Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • El Paso • Houston Indianapolis • Jacksonville • Kansas City • Los Angeles • Louisville • Midland, Texas • Milmaukee • Minneapolis • New York • Philadelphia Pittsburgh • Portland, Oregon • Springfield, Mass. • St. Louis • Salt Lake City • San Francisco • Seattle • Tulsa • Worcester Distributors in principal cities in the United States and abroad.



#### WHEN TRAXCAVATORS. GO DEEP!

■ Bowen Construction Co. wanted steady performance, hour after hour, in its underground quarry near Kansas City, Mo. The company wanted consistent rock loading for continuous production in the confined quarters.

A T6 TRAXCAVATOR produced the wanted results!

The heavy-duty, production loader was lowered down the 80-foot shaft... began loading shot rock from an 18-foot vein of Bethany Falls limestone. The T6's Quarry Bucket is power-crowded full of the punishing rock... then with hydraulic bucket snubber control it carefully feeds a portable primary crusher in the underground mine. The result: production jumped

to more than 100 tons of the abrasive limestone each hour.

You can get desired performance plus, whether your work is above ground or below—with a TRAXCA-VATOR. Ask your "Caterpillar" Dealer for details on TRAXCAVATOR's features and how they can work for you—profitably... or write direct.

CATERPILLAR TRACTOR CO., Peoria, Illinois

TRACKSON





Just fill out the coupon. See DETONITE in action right at your quarry. Know how cost-minded quarrymen, for over 15 years, have lowered costs with DETONITE...in these four important ways:



#### 1. BLASTING COST

KING DETONITE is a slow-detonating powder. Its slow, heaving, spreading action lifts and fully displaces the burden. High cost of secondary drilling and shooting is greatly reduced.

#### 2. ROCK-HANDLING COST

KING DETONITE breaks up rock into sizes that permit shovels to dig efficiently at all times, thus reducing handling costs to a minimum.

#### 3. EQUIPMENT MAINTENANCE COST

KING DETONITE's proper fragmentation means less wear and tear on expensive equipment . . . less cost for maintenance and replacement.

#### 4. PROCESSING COST

KING DETONITE's proper fragmentation allows your crushers to operate at top capacity, thus lowering cost of processing the stone.

	WAYS TO CUT COSTS	
	Inc my	1
,,,,,	King Powder Co., Inc. Cincinnati 1, Ohio SHOW ME how DETONITE will cut my costs 4 ways. Without obligation, have the King Rep. costs 4 ways. Without with me to arrange for a resentative get in touch with me to arrange for a DETONITE demonstration right at our quarry.	1
1	Name	
1	Title	
1	Company	
1	Address or phone us	coll

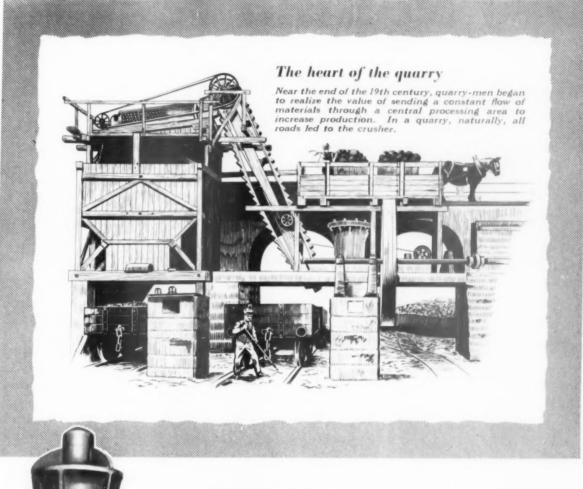
# DETONITE

PATENTED SURFACE-SENSITIZED EXPLOSIVE

#### THE KING POWDER CO., INC

CINCINNATI 1, OHIO

MAKERS OF QUALITY EXPLOSIVES SINCE 1878



For 50 years, Traylor has worked closely with the men who look for ways to increase their production. As ideas and methods changed, Traylor developed better, more efficient machinery to meet these new standards of production. It is this experience, gained by working closely with customers for half a century that makes an order for Traylor equipment a wise order today.

The Traylor TY Reduction Crusher features modern, compact design for maximum production with minimum maintenance. Ask for Bulletin 6112 for specifications and description.



TRAYLOR ENGINEERING & MANUFACTURING CO. 1405 MILL ST., ALLENTOWN, PA.

> SALES OFFICES: New York • Chicago • Los Angeles Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.



leads to greater profits





## **Dry Rolling Toggle**

with Rockin' Chair Motion



Reduces Maintenance and Downtime



No Lubrication Needed

No DAMAGING sliding action of toggle ends and seats when you equip your jaw crushers with dry rolling toggles!

You get a rolling, 'rocking chair' movement of these vital moving parts. No lubrication is needed, yet toggle ends never overheat! Oil lines and messy oil drip are eliminated — resulting in increased safety.

And — dry rolling toggles outlast conventional toggles . . . operate with reduced maintenance.

A.3738

A-37

You can easily make your jaw crusher operations more profitable with dry rolling toggles. Call the A-C representative in your area, or write Allis-Chalmers, Milwaukee 1, Wis.

A-1 is an Allis-Chalmers trademark.

#### **ALLIS-CHALMERS**

Sales Offices in Principal Cities in the U.S.A. Distributors Throughout the World.



Hammermills



Vibrating Screens



Jaw Crushers



**Gyratory Crushers** 



**Grinding Mills** 



Kilns, Coolers, Dryers

and then some!

#### HARD ROCK LUG

Super-tough champ for all types of rock work. Its armored body and extra-heavy lugs assure longer wear, better performance, even in the toughest going.



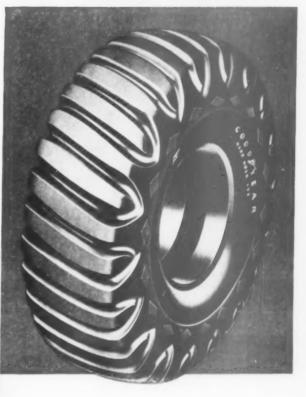
There's A Cost-Cutting Goodyear Tire For Every Job

#### HARD ROCK RIB

Companion tire for front wheels in rock work easier steering, smooth rolling, same cord body and construction as the Hard Rock Lug.

#### **ROAD LUG**

Dual-purpose tire operates both OFF and ON the road. Combines offthe-road toughness and traction with on-the-road mileage and economy.



Co ruggedly tough is Goodyear's Hard O Rock Lug tire that it can take the bruising punishment of pit, quarry and mining service longer and better than other tires. That's why it's first choice with cost-wise operators in all types of rock work. Get the right Goodyears for your jobs, and experience will prove that it pays to BUY and SPECIFY Goodyear.

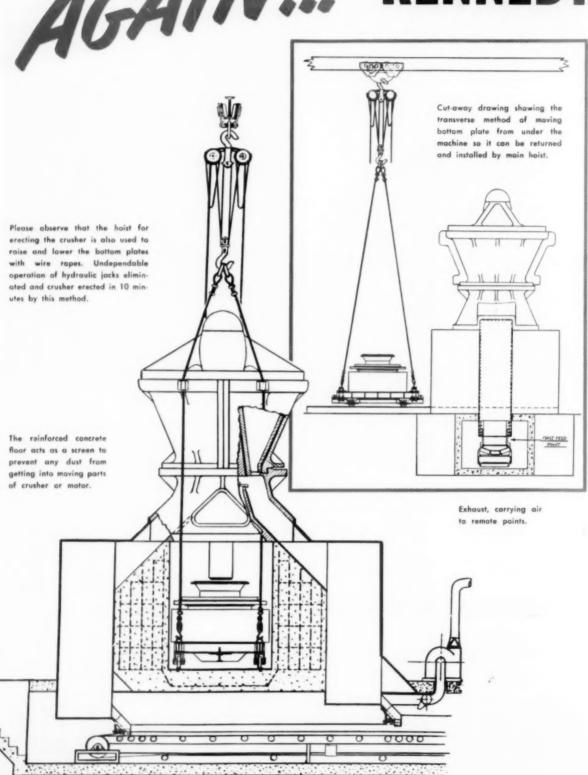
Road Lug-T. M. The Goodyear Tire & Rubber Company, Akron, Ohlo

Best proof of cost-cutting performance:

MORE TONS ARE HAULED ON

TIRES THAN ON ANY OTHER KIND

# AGAIN... KENNEDY



# PRESENTS AN INNOVATION IN CRUSHING EQUIPMENT!

#### NEW GYRATORY CRUSHER WITH DUAL DISCHARGE OUTLETS INCREASES OUTPUT, EFFICIENCY AND LONGER WEAR

Only KENNEDY has the correct answer to the "Sticky Ore" problem! KENNEDY Gearless Gyratory Crushers are now built with TWO DISCHARGE OUT-LETS plus an exclusive "No-Stick" feature that doubles efficiency and output. This distinct innova-

tion in crusher design is another "FIRST" for the world-famous line of KENNEDY crushing equipment.

Hard-to-crush rock and ore such as limestone, trap rock, basalt, taconite, slag, etc., containing as high as 50% clay, can be handled without sticking or clogging by the exclusive KVS process.

No other crusher offers this advantage. Double discharge outlets, built at angle of 70° degrees, assures uninterrupted delivery of material. Other crushers, with single 42° degree outlets, operate more slowly because the discharge outlet becomes clogged with sticky clay or taconite ore.

In the new KVS crushers, rock and ore pass through mantle and concaves at bottom. A vertical drop of 6 feet then quickly and surely disgorges sticky clay, etc.—greatly speeds production by eliminating clogging—saves countless man hours clearing stalled crushers.

#### CHECK THESE FEATURES

Synchronous motor built into pulley assembly

Smooth frictionless operation because the crusher is

Power used ONLY for crushing

All moving parts carried on self-aligning roller bearings

KVS forced-feed oiling system pumps four barrels of oil per hour through bearings without waste

Eccentric and ball are spray babbited. NONE has been rebabbited in over three years

Send for bulletins describing all types of KVS crushers. Let us prove that "It Costs Less To Own The Best".



KENNEDY-VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

TWO PARK AVENUE, NEW YORK

FACTORY DANVILLE, PA.



#### Portable Drainage Ditch for a Sunken Roadbed

 The rock floor of this limestone quarry, nearly a hundred feet below ground level, presents a constant drainage problem.

Men and equipment must be free to work around the clock in any kind of weather... free to work despite rain squalls, spring thaws or the gradual seepage of surface water through the overburden.

And, since the work location shifts as each load of stone is removed, the drainage facilities must be able to move with the shovels.

Getting the water off is a job for hose . . . a tough, flexible water carrier that can be dragged over abrasive surfaces, subjected to falling rock, snaked into out-of-the-way crevices and lengthened or shortened at the turn of a coupling.

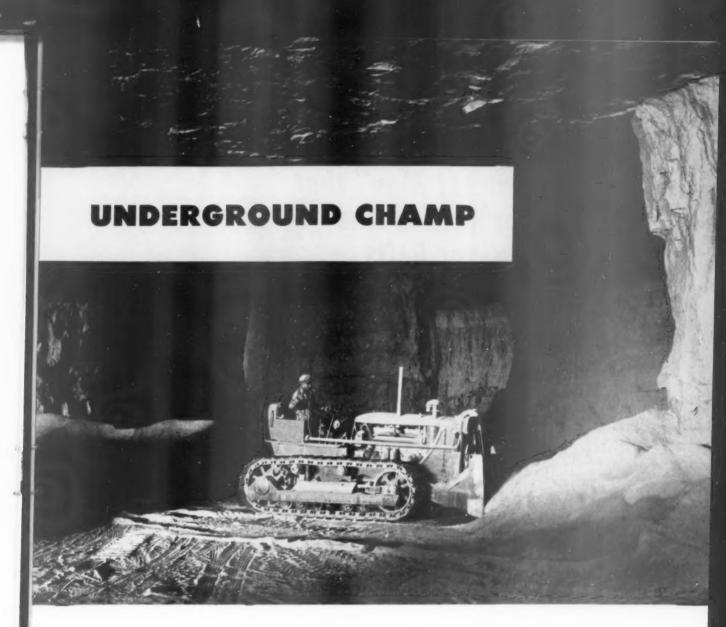
The Bessemer Limestone Company, a Republic Rubber customer for more than a generation, uses Republic's Water Hose for this purpose.

They use Republic Hose because it stands up better, handles easier, lasts longer on the job.

Water Hose is just one of Republic's complete line of Industrial Rubber Products that is quality built and sold through Republic Distributors who are experts in their job of helping you select and apply the right hose or belt for your specific job.

Your Republic Distributor is ready to make a complete, free analysis of your requirements now. Contact him or write us today for full facts on how this analysis results in better performance, better service and less costs for you on the job.





Each day a thousand tons of limestone come up from this Black White Lime Company mine near South Quincy, Ill. Here a "Caterpillar" Diesel D6 Tractor and No. 6S 'Dozer help keep that production rolling.

Right at home underground, this rugged D6 stands up against the worst kind of abrasive soil conditions, its vital parts sealed against damage. And the curved blade picks up capacity loads hour after hour. Working with this dependable team are two "Cat" Diesel D4 Tractors with loaders, a Lorain TL-25 Shovel and a "Caterpillar" Diesel D315 Engine, "We switched to all-'Cat' equipment because it's much more dependable," Vice-President W. G. Black says. "In this business, dependability is of prime importance. If you're down, it disrupts all your plant,"

Mr. Black knows that dependability is built right into his big yellow machines. On his No. 6S 'Dozer, for instance, side arms are of tough box section construction; the curved blade is made of special high tensile steel; the high carbon steel cutting edge combines hardness and toughness in just the right degree; even the end bits on the blade are of alloy steel specially treated for longer, harder wear.

"Caterpillar" Bulldozers are built to match the power output of their running mates, "Cat" Diesel Tractors. They offer a choice of hydraulic or cable control, straight or angling type blade, and they adjust easily for tilt and pitch. There's a size for any job, above or below ground. Drop in and see your nearby "Caterpillar" Dealer for the full story.

CATERPILLAR TRACTOR CO. . PEORIA, ILLINOIS

#### CATERPILLAR





#### – prevent it with BWH ROTOCURED Belts!

Belts made by the flat press method start with two, ten, twenty or more "strikes" on them — depending on the length of the belt. Weakened segments (inherent in the manufacturing process) result at 30- to 40-foot intervals because of press overlaps and hence, overcuring. The overlapping can't be avoided in flat press curing because each section when cured advances less than a full press length. Result: Premature failure of the weakened sections.

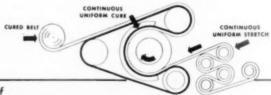
To eliminate these weak segments, BWH engineers pioneered ROTOCURED CONVEYOR BELTS. They're made by continuous, constant motion curing. This endless technique of curing by eliminating overlapping, eliminates the weak segments. Every inch of the belt you buy is FIRST QUALITY!

You'll see this quality in Increased Belt Flex Life (up to 40%)... Elimination of Mechanical Distortion at the Press Ends... Constant, Uniform Stretch... Uniform, Abrasion-Resistant Covers.

If you have a tough conveying problem — put it up to your BWH distributor\* and BWH ROTO-CURED BELTS. He has the "savvy" to solve it — the belt has the strength. Watch the cost per ton of material conveyed go down!

\*Ask bim also about BWH Transmission Belts. He'll show you how their operation at lower tensions assures longer belt life.

DIAGRAMMATIC SKETCH OF EXCLUSIVE ROTOCURE PROCESS





Another Quality Product of

#### BOSTON WOVEN HOSE & RUBBER COMPANY

Warehouse Stock: 111 N. Canal St., Chicago, Illinois Distributors in all Principal Cities PLANT: CAMBRIDGE, MASS. \* P. O. BOX 1071, BOSTON 3, MASS., U.S.A.



#### The toughest three-letter word in business

"But . . ."

The word a man uses when he starts by nodding yes and ends by saying no.

"But . . . "

The word on a Multiwall buyer's tongue just after he's said, "Well, as long as we order by specification, I guess one brand's as good as another . . ."

Executives who purchase more than 85 per cent of all Multiwalls have a big BUT there.

They testify\* that there are many other considerations. Among the most important, the reputation of the manufacturer. They judge him by his record of reliability, his effort to meet delivery dates, his willingness to give a full measure of service.

We welcome the challenge of the toughest three-letter word in business. We believe the attention big buyers of Multiwalls pay to the *extra* factors—dependability, for instance—has a lot to do with their giving Union a greater proportion of their Multiwall business.

More so every day . . .

#### IT'S UNION FOR MULTIWALLS





#### "Our Dodge trucks stay on the job"

. . . says R. V. Venable, Quarry Owner, Elberton, Ga.

"Our first Dodge is still on the job after eleven years," says Mr. Venable. "And in all that time, the rear end and transmission have been overhauled *only once*.

"We've tried other trucks, but they just couldn't stand the gaff. With Dodge, our trucks' cost of operation and maintenance has been at a minimum.

"What really counts is that our Dodge trucks stay on the job—both out of the pit and on delivery. That's why every truck we own today is a Dodge 'Job-Rated' truck!"

You'll find hauling men everywhere in ready agreement with Mr. Venable. And why not? They know that Dodge trucks are factory-engineered to fit the job . . . to save money and last longer.

Consider a high-tonnage Dodge, for instance. Its husky, high-compression power plant gives you power to spare on toughest jobs. You get top economy from proved dependability features like chrome-plated top piston rings and intake and exhaust valve seat inserts—plus twin carburetion and exhaust system. And because of better weight distribution you can haul bigger payloads without overloading.

Of course, this is only part of the story on the extra power, economy, and dependability of Dodge "Job-Rated" trucks. There's a neighborly fellow near you who'll be happy to help you with your hauling needs. He's that friendly Dodge dealer who specializes in the right truck for the job. And he's willing to talk things over with you any time you like.

#### DODGE Job-Rated TRUCKS

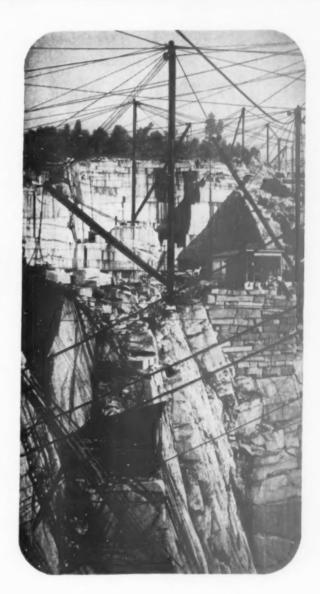
# WIRE ROPE

#### This is the most economical rope we've ever made for quarries

ROEBLING is the best known name in wire rope. That's partly because we were the first wire rope maker in America. But more than that, we've always led in developing better wire and better rope for every purpose.

Today's Roebling Preformed "Blue Center" Steel Wire Rope is the quarryman's best choice for efficiency and long life. This rope has extra resistance to crushing and abrasion . . . stands up under rough going. It saves you time and cuts costs.

There's a Roebling wire rope of the right specification for top service on any job. Call on your Roebling Field Man for his recommendations. John A. Roebling's Sons Company, Trenton 2, New Jersey.





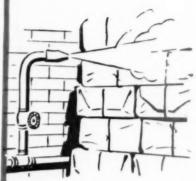
ATLANTA, 934 AVON AVE . BOSTON, SI BLEEPER ST . FREDDMIA AVE . CLEVELAND, 701 ST, CLAIR AVE, N. E. THEY AVE S. . TULSA, 321 N. CHEVENNE ST . EXPORT SALES



#### NO. 1 OF A SERIES ON HOW TO Stretch a MULTIWALL Paper Bag

It is just good business to get the best possible use from your multiwalls. Here is one way to do it...

Keep Storage Rooms Humid:



Let steam escape in bag storage room to keep air and bags humid. Keep a humidity indicator in the storage room and check it frequently. Always leave aisles or spaces between stacks of bags to allow circulation.



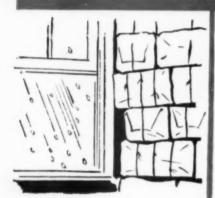
Store bags on dunnage, away from floor, and keep floor wet so moisture can be absorbed into air. A relative humidity of about 50% at warm temperature is best.



J Drill small "needle" holes in horizontal water pipes. Hang cloths over holes. Air absorbs moisture from wet cloths.



Hang wet cloths over edge of water barrels. Cloth absorbs water and air absorbs moisture from cloth, Keep barrels well filled.



Open windows on damp or rainy day. Damp outside air will circulate in the bag storage room. Multiwalls are strongest when moisture content of the paper is about 6 or 7%.



Use commercial humidifying apparatus, Many types of commercial humidifiers are available with capacities to suit individual requirements.

#### Want the Whole Story?

Ask your Bemis Man for free, illustrated copy of Bemis Multiwall Packaging Guide. It deals with Storage, Filling and Closing, Handling, Palletizing and other important subjects.

If you need cotton or burlap bags also, Bemis is your best source.



# Selected selected for cost-saving performance

B&W alloy nose-ring castings installed in 36 kilns during the past year raised the total to 156 sets—more than 7000 pieces—now in operation on rotary kilns at plants of the leading companies listed at the right.

Since B&W research and engineering developed these lighter, stronger, more functional castings less than twelve years ago their outstanding record of performance has completely confirmed their "cast-to-last" reputation. A service life spanning ten years is not unusual, effectively demonstrating the ability of B&W nose-ring castings to outlast conventional high-alloy types by a wide margin.

If your company's name is not on the accompanying list, it will pay you—in initial and long-term savings—to put it there. Write: The Babcock & Wilcox Company, 161 East 42nd Street, New York 17, N. Y.



Aetna Portland Cement Co. Allentown Portland Cement Co. Alpha Portland Coment Co. J. E. Baker Co. Basic Refractories, Inc. Bessemer Limestone & Cement Co. The Dolite Company Foote Mineral Co. Gibsonburg Lime Products Co. Hercules Cement Corp. Huron Portland Cement Co. Keystone Portland Cement Co. Lawrence Portland Cement Co. Lone Star Cement Corp Minnesota Mining & Manufacturing Co. Nazareth Cement Co. North American Cement Co. Peerless Cement Corp. Penn-Dixie Cement Corp. Pittsburgh Coke & Chemical Company Pittsburgh Plate Glass Company Columbia Coment Division Universal Atlas Cement Company Valley Forge Cement Company **Volunteer Partland Cement** Whitehall Cement Manufacturing Company



5-410

# TORQUE CONVERTER



Adding a torque converter, electric shift, and electric steer control, to 19 m.p.h. Tournadozer is another development to help you move dirt faster and at lower costs. With these additional features, Tournadozer becomes an even greater producer on high-speed pushing, pulling and dozing assignments. The single-stage torque converter is a simple, trouble-free type, which combines the advantages of a hydraulic torque converter and a fluid coupling.

Teamed with the constant mesh transmission, it provides an infinite speed range from 0 to 19 m.p.h., and automatically selects the proper ratio for delivering maximum power in a steady, even flow to Tournadozer's wheels. This enables the engine to operate at maximum r.p.m. and at highest efficiency. Torque converter absorbs practically all shock-loads between engine and drive wheels . . . gets more work done dozing, climbing grades, pulling through mud, snow, ice, sand. It improves performance, increases accuracy in holding cuts to grade and in close finishing.

Combining low-pressure, 21.00 x 25 rubber tires and constant-mesh transmission with torque converter, Tournadozer

gives you the smoothest running dozer you've ever seen! You get instant speed selection at the touch of an electric switch . . . no delay . . . no de-clutching or loss of vital momentum for shifting gears.

Wheel speeds are automatically adjusted to give you maximum power delivery in gear range selected, thus eliminating shock loads or need for frequent gear change. With 4 forward speeds, 2 reverse, plus torque converter, you get an infinite speed range with most effective use of power over every foot of the way. This constant, smooth power, always available contributes to increased output plus lower maintenance and longer machine life.

Check all the advantages you get from new torque converter, plus the new electric shift and steer control, which combine to make Tournadozer by far the fastest, most efficient dozer money can buy. It will pay you to contact your LeTourneau Distributor . . . he'll be glad to show you how these advantages help Tournadozer to do more work on all your jobs per hour . . . per day . . . per year.



## makes TOURNADOZER even greater producer

## I Smooth acceleration—infinite speed the level, up steep grades, or in soft going.

#### 2 Better traction -steady pull of smooth flowing power gives big, low-pressure tires a firmer grip in tough footings to pick up and carry bigger loads without slippage.

#### 3 Longer tire life- peak loads in tire acceleration are eliminated, giving better wear, longer, more economical service.

#### 4 No shock or vibration - shock loads of sudden speed increases are absorbed in oil of torque converter and eliminated from transmission and entire power train.

#### 5 Higher engine efficiency - con. stant horsepower cuts down engine wear . . . eliminates lugging . . . reduces maintenance expense . . . adds to engine life.

# TORQUE CONVERTER gives you all these advantages

#### Steady engine speed—assures maximum voltage to electrical equipment . . . improves service and life of engine attachments.

#### 7 Accurate grading - smooth, perfect balance of torque against load gives accurate control of blade at all times.

#### Single-stage torque converter - simple and trouble-free . . . not dependent on seal efficiency for converter efficiency.

#### Easier operation -smoother performance throughout cycle increases operator efficiency . . . boosts your production.

#### 10 More yards per hour-use of maximum engine horsepower gives higher average speed, higher ratio of operating efficiency, more work done.

additional Check available attachments



Down pressure blade (optional) - nev available, assures quick positive pens-tration in wet frazen send, clay, hard-pan, ether hard materials. Electrically-operated PCU, plus short-coupled cable gives fast, smooth blade control.



Ampledezer — simplifies side-hill work. 13' x 41½' blade can be engled 20' right or left . . is easily interchanged with standard buildozer blade. Reet Rake, Tree Stinger also available for use an same A-frame.



47.000-lb. winch - plenty of power for 67,000-tb. wints --plenty of power for only winch application. Push-button con-trolled and powered by two 2-speed elec-tric moters. Speels, unspeels at 56 or 113 ft, per min. Big sheave forliead permits pulls to 90°. Tops for skidding pipe, logs, etc.



Snew Plow-has 12' 4" clearing width ...flows snow 6 ½ 'high aff ands of V-type plowshare blade. When not needed for clearing haul reads or floor of pit, can read-

R. G. LETOURNEAU, INC.

PEORIA, ILLINOIS



# 1200 c.f.m.

Here's an efficient, dependable set-up for a job requiring 1200 cubic feet of air a minute — two CP Model 600 Diesel-driven PORTABLE AIR COMPRESSORS.

Whenever less air is needed, however, the CP Gradual Speed Regulator takes care of smaller demands by reducing engine speed proportionately, minimizing wear and maintaining peak economy.

The wide range of CP time-tested gasoline and Diesel-driven Portable Compressors — from 60 c.f.m. to 600 c.f.m. — permits the selection of the most suitable equipment for any particular kind of job.



PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES



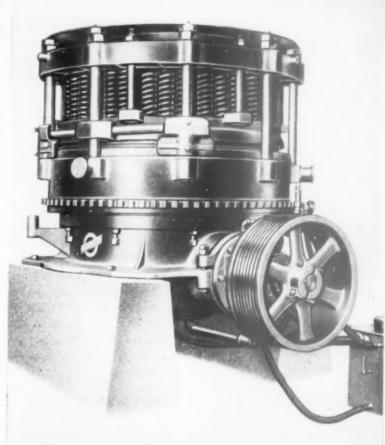
# TELSMITH Gyraspheres 34,65

Outstanding—with its new, heavier design and many Telsmith-engineered improvements tested and proved by years of operation—the new Style S Standard Gyrasphere has...

- 1. Longer Crushing Stroke ... for greater capacity.
- 2. Larger Roller-Thrust Bearings... both now located at top of eccentric ... to transmit crushing pressures from bottom of head direct into main frame.
- **3.** Eccentric Bearings have *more* bearing area in the upper zone of greatest crushing pressures.
- 4. Longer Springs... to pass larger pieces of tramp iron.
- 5. New Location of drive gears ... for more economical operation.
- **6.** Easier accessibility... makes maintenance quicker, simpler, and cheaper.
- 7. Available with either coarse or medium bowl.







SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St. 211 W. Wacker Drive New York 17, N. Y. Chicago 6, Ill. 713 Commercial Trust Bldg. 238 Main Street Cambridge 42, Mass. Milwaukee 3, Wis. Columbus 9, Ohio Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash. Mines Eng. & Eqpt. Co., San Francisco 4, Calif. Interstate Equipment Co., Statewille, N. C., Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.





DIAMONDS have been the supreme jewels for centuries—yet the real value of the diamond today is found in its industrial applications, where fully 75% of the diamonds mined are used. In South Africa, the largest diamond producing region in the world, these crown jewels of industry are found deep in the earth, in volcanic rock known as blue ground . . . and for every ton of blue ground mined, less than 1/8th carat is recovered.

Of prime importance to the major diamond mines of South Africa is a dependable method of crushing the blue ground to the required fineness without destroying the diamond crystals, yet maintaining a minimum cost per ton produced. This important combination is found in the "SYMONS" Cone Crusher . . . and extensive installations of these crushers, as well as "SYMONS" Vibrating Screens, in the world's diamond mines testify to their ability to maintain, year after year, continuous high capacity production with uninterrupted, trouble-free service.

NORDBERG MFG, CO., Milwaukee, Wisconsin

• "SYMONS" Cone chines that revolutio

heads from 22 inches

and Intermediate typ

"SYMONS"... A NEDERLA PROPERTY KNOWN THROUGHOUT THE WORLD



MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK + SAN FRANCISCO - SPOKANE - WASHINGTON - TORONTO

MEXICO, D. F. - LONDON - FARIS - JOHANNESBURG



"SYMONS"
Primary
Crushers







C552



"SYMONS"
Vibrating Ber
Grizzlies and Screen



Diesel Engines

for handling practically any materials ... from aggregates to asparagus Thermoid has the right conveyor belt for your job

From years of experience in materials handling problems, Thermoid has developed a full line of superior Conveyor Belting. Only the finest materials are used, scientifically compounded to withstand wear and carry the load dependably. This extra margin of endurance means fewer delays due to belt breakage or premature wear.

Whether you are handling boxes, bags, cartons ...stone, sand, gravel or other aggregates—consult your Thermoid distributor. He can recommend the right type of Thermoid Belt to do the job at the lowest cost per ton of material moved. Write today for your copy of the Thermoid Conveyor Belting Catalog.

Conveyor & Elevator Belting • Transmission Belting F.H.P. & Multiple V-Belts • Wrapped & Molded Hose



Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company · Offices & Factories: Trenton, N. J., Nephi, Utah

# Allison

# has delivered 10,000 Tank Transmissions for National Defense!

PTODAY, less than three years after the first production delivery, Allison has I built and shipped 10,000 Torquatic Transmissions for Army Ordnance vehicles.

These revolutionary cross-drive transmissions resulted from General Motors' long experience in the manufacture of heavy-duty transmissions and torque converters. They provide great mobility, maneuverability and easy control to America's tanks and other track-laying vehicles. Hydraulic gearshifting, steering, braking are combined in a single, compact unit. Operators in Korea say that tanks with these transmissions can "stop on a dime" and spin in their own length, with minimum driver fatigue.

#### Commercially -

Today, Allison continues to deliver to commercial manufacturers Torquatic Converters and Transmissions using the same basic principles. The Allison Torquatic Drives bring smoothness, flexibility and economy never before experienced to many types of heavy-duty equipment such as are shown below. Write for information.

ALLISON DIVISION OF GENERAL MOTORS, Box 894, Indianapolis 6, Indiana

















Illustrated is General Patton tank with cutaway view

of Model CD-850 Allison Torquatic Transmission

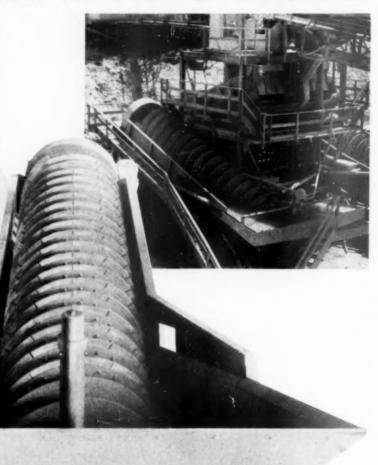


## WORE SPECIFICATION SANDS AT LESS COST with WEMCO SAND PREPARATION MACHINES

More and more operators are proving this outstanding fact about WEMCO machines:

 you actually get a greater production of clean, specification sands at substantially lower costs per ton than is possible with any other type of equipment.

The WEMCO Sand Preparation Machine was designed to produce specification sands economically. Its almost automatic operation gives sharp, accurate separations between desired sands and waste materials such as slime, clay and excessive size fractions.



**WEMCO** superiority in producing clean, specification sands is the result of these important features:

- · large settling area
- · wide overflow weir capacity
- · high raking capacity
- · sharp size separations
- · low maintenance costs
- · low horsepower
- minimum attendance requirements

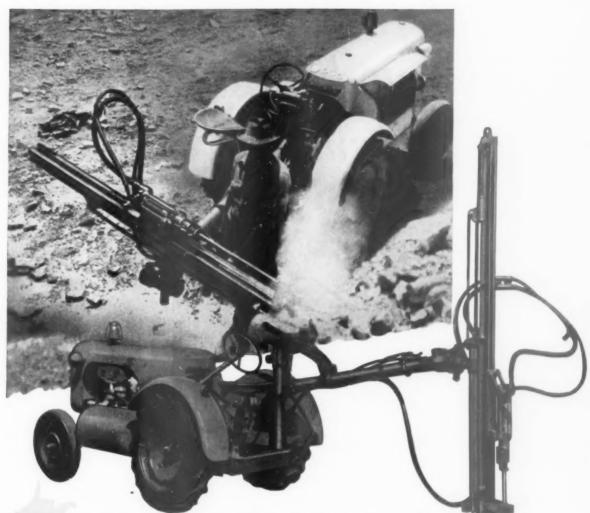
#### Let WEMCO help you!

Whatever your sand washing problem may be, WEMCO can help you get more specification sands at lower cost! Write today for our engineering recommendations — no obligation, of course.

WESTERN MACHINERY COMPANY
760 760 FOLSOM STREET - SAN FRANCISCO 7, CALIFORNIA

OTHER WEMCO PRODUCTS

Mobil-Mills « Caal Spirals » HMS Thickeners « HMS Pumps » Sand Pumps Cone Separators » Drum Separators » Fagergren Laboratory Units » Agistors Fagergren & Steffensen Flatation Machines » Hydroseparators » S.H. Classifiers HMS Laboratory Units » Dewalering Spirals « Thickeners » Conditioners » Densifiers



## West Virginian doubles footage for less than half equipment cost!

## Uses TRACTAIR with Mobildrill

Self-propelled, self-contained wagon drill and air compressor

permits him to drill 4-6 holes of a pattern from one spot.

See for yourself how a Tractair with Mobildrill meets your requirements for fast, flexible drilling. Make arrangements with your nearby Le Roi distributor to watch a Tractair with Mobildrill at work. Also investigate the complete line of Le Roi-CLEVELAND rock drills — handheld machines from 19 to 80 lbs., light and heavy wagon drills, the exclusive T-286 Dual Drill Rig, and a complete line of portable air compressors.



As much as 750 feet of hole daily, where only 300 feet were drilled before! More than double the production of three hand-held sinkers and a 315-cfm compressor! Substantial savings on both fuel and equipment costs! That's the remarkable record a Le Roi Tractair with Mobildrill set for one user in West Virginia.

Tractair with Mobildrill is a light-weight Le Roi-CLEVELAND wagon-drill unit mounted on Tractair — a combination 35-hp tractor and 105-cfm compressor.

One man can drive the Tractair with Mobildrill — and go places he couldn't get to if he had to tow separate compressor and wagon drill. He can sink vertical or drill horizontal holes at any angle up to 12' high. Swinging boom

#### LE ROI GOMPANY



SEND COUPON BELOW FOR PREE BULLETIN
Tear out coupon and mail today!
LE ROI COMPANY, Dept. RP-7
1704 5 48th Street Millergules 14. Wisconsin

LE ROI COMPANY, Dept. RP-7 1706 S. 68th Street, Milwaukee 14, Wisconsin Send me bulletins that describe Tractair wish Mobildrill and T-286 Self-Propelled Dual Drill Rig.

# Time to light another candle...



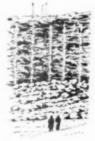
It was 1802...150 years ago...when Eleuthère Irénée du Pont de Nemours began making black powder in a fieldstone mill along the banks of Brandywine Creek near Wilmington, Delaware.

Research...experimentation...even then held
a place of high concern in the development
of a product soon known for its superior quality.
From that humble beginning, so significant of the
way of life in this new country, research has constantly
played an important part in the colorful history
of the Du Pont Company.



NE HUNDRED YEARS passed. In 1902 . . . now half a century removed . . . Du Pont established Eastern Laboratory at Gibbstown, New Jersey. It was one of the first in the United States to be entirely devoted to industrial research. Here, old products were improved; new ones developed and perfected. And as always, consumers, technical representatives and the laboratory's chemists, physicists and engineers cooperated in the work. The keynote was progress. Today, such research has become an indispensable, integral part of Du Pont's continuing program of product improvement. Laboratory facilities now embrace over 75 buildings, a proving ground of some 3600 acres and an experimental tunnel and mine.

Many industries have benefited from these untiring efforts. In the field of quarrying alone, an imposing list of product developments contributed largely to the advancement of the in-



dustry. Men now long engaged in quarry operations may well recall the introduction of some

of these. Younger men will recognize other, newer products of Du Pont Explosives Research. Among these contributions to a basic industry are the following:

#### DU PONT PRODUCTS OF EXPLOSIVES RESEARCH

Low-freezing dynamites

Ammonium nitrate dynamite

Ammonium nitrate Gel-

Low-density ammonium nitrate dynamites

"Nitramon"

"Virginia"

Electric blasting cap shunts

Tetryl caps Shielded shunts Rubber plugs in electric blasting caps

Plastic insulation on electric blasting cap wires

Static resistant electric blasting caps

Safety Blasting Switch

Blasting Timer

Detect-A-Meter

Primacord "MS" Con-

Primacord Boosters

Condenser Discharge Blasting Machine

But what is new today may become obsolete tomorrow, next week or next year. That is why the job of research never ends. And constant research is why Du Pont Explosives have earned world-wide recognition. For 150 years they have met the specialized needs of the quarrying industries and of the men whose work requires dependable performance in a wide variety of products. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

#### Du Pont Explosives

Blasting Supplies and Accessories



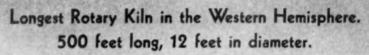
150th Ammiyersary

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY



# SMIDTH

ROTARY KILNS



Designed and Furnished by F. L. Smidth & Co. for Penn-Dixie at Kingsport, Tenn.

For Smidth Machinery apply to:

- F. L. Smidth & Co., A/S Vestergade 33, Copenhagen K, Denmark
- F. L. Smidth & Cie France 80 Rue Teitbout Paris (9e) France
- F. L. Smidth & Co. 11 West 42nd Street New York 36, N. Y.
- F. L. Smidth & Co. of Canada, Ltd. 11 West 49nd Street New York 36, N. Y.
- F. L. Smidth & Co., Ltd., 105, Piccadilly, London, W. 1, England
- F. L. Smidth & Co. (Bombay) Ltd. 42 Queen's Road Bombay, India

# WE HEAR...

July, 1952

The National Production Authority recently issued a new order designed to aid the nation's iron and steel producers in getting MRO supplies and materials needed for minor capital additions and replacements up to \$5000 in value. The order also sets up priorities for use by the steel industry in getting materials needed for larger repair and maintenance work such as relining blast furnaces and rebuilding open hearths.

Vandals caused an estimated \$400 to \$500 damage to the equipment of a concrete pipe company in Idaho. The vibrator machine had been turned on and allowed to run until it burned out. Also, two 10 ft. lengths of 32-in. pipe were damaged.

Soil-cement stabilizing along the Lincoln Highway is being considered by the Wyoming State Highway Department. Cement would be mixed with the gravel used in constructing the base course of the road with the conventional surface mat over the top. As explained by the department's chief materials engineer, this method would give "borderline" gravel more stability in base course construction and would eliminate instability of the course through moisture seepage. The state has already undertaken soil-cement base course construction between Gillette and Morecroft.

During the past 50 years, the American work-week has shrunk from 60 hr. to 40, while production per man has multiplied five times. Labor saving machinery, better planning and management, and better trained and more intelligent workmen, were said to be the factors responsible for the increased production.

Recent finds of uranium deposits in South Dakota and Wyoming point to a whole new area that is favorable for prospecting for uranium, according to a recent government report. Carnotite, one of the principal ores of uranium in the U.S., has been found in the Craven Canyon area in southwestern South Dakota. Craven Canyon is a little over 100 miles southeast of the uranium deposits recently discovered by the Geological Survey in the Pumpkin Buttes area of northeastern Wyoming. The ore is said to be similar to the carnotite of the plateau of western Colorado and eastern Utah.

Strikes cost the nation 5,300,000 man-days of production during the month of April, according to Bureau of Labor Statistics report. A million workers were involved in strikes during the month—the largest number for any month since 1946.

Only a small percentage of the federal automotive excise taxes collected since 1930 has been used for highway construction or improvement, as recently reported in Road Builders' News. Motorists and trucking firms actually have paid for the improvement of highways that are being allowed to deteriorate, while funds which should have been used for highway construction have been put to other use. According to the report, states diverted \$3,060,508,000 in the period from 1924 to 1952, an amount sufficient to build 9000 miles of four-lane, divided highways.

To stop this diversion of highway funds, 21 states have taken action by constitutional amendment and other states are considering such legislation. The automotive excise is intended for roads and streets and where diversion of such funds is still being practiced, highway users (the ones paying the tax) should take a determined stand against this misuse of funds.

According to a Chamber of Commerce report, the <u>U.S. plans to spend almost 20 percent of its gross national production on defense during the coming year.</u> By contrast, Great Britain will spend 12.8 percent; France, 11 percent; and Western Germany, 10.5 percent. All three countries are recipients of American aid.

Construction contract awards in the 37 states east of the Rockies for the first four months of the year totaled \$4,706,068,000, or 2 percent less than the comparative 1951 figure, according to an F. W. Dodge Corp. report. Non-residential awards of \$1,684,612,000 were down 10 percent; residential awards of \$2,008,490,000 were down 5 percent; public and private works and utilities, totaling \$1,012,966,000, were up 22 percent. Total construction awards for the month of April showed a 21 percent increase over March and a 16 percent increase over April of 1951.

The National Production Authority recently dropped more than 20 now plentiful metals, chemicals and other materials from its list of scarce goods subject to the anti-hoarding order. Among the metals were antimony, bismuth, cadmium, lead, zinc and zinc-base alloy in crude form. Among the chemicals were carbon tetrachloride, methanol, phenol, quinoline, styrene and plastic-type nylon. Other materials removed from the list included wood pulp, quebracho and natural rubber latex.

Ohio farmers set an all-time record in 1951 in spreading limestone, according to an Ohio State University agronomist. Approximately 2,211,000 tons of limestone were spread in 1951, compared to 1,623,000 tons in 1950.

Factory employment for the first quarter of this year was approximately 15.8 million, or 162.9 percent of the total employed during the 1935-1939 base period. The employment level was slightly under that of the last half of 1951 and below the 16 million (164.9 percent) employed during the first quarter of last year. Hours worked remained about the same as the last quarter of 1951, although the March figure of 40.7 hours per week showed a slight drop from the 41.2 worked during December, the peak month of 1951.

Three members of one family and a fourth man were killed by a landslide during gravel excavating operations of deposits located on their farm property near Hastings, Mich. It was theorized that the <u>four victims were working on a dragline or preparing a charge of dynamite when the landslide occurred.</u>

. . . . . . . . .

The British government recently announced that one of the world's largest deposits of uranium has been found in Nigeria. The deposit lies in the north-central part of the British West African colony, 20 miles from the nearest railway. Geologists estimated that each ton of ore contains \$14 worth of uranium and niobium (columbium), a scarce metal used in heat-resistant alloys for jet engines. According to the report, the deposit covers about 200 acres and there are 700,000 tons of ore to the vertical foot. Depth of the deposit has not been determined.

According to Missouri Pacific Lines, to pay the average employe an hour's wages in 1931, the railroads hauled a ton of freight 67.2 miles; in 1951, they hauled it 132.2 miles. Compared with 1931, the average annual compensation for all railway employes in 1951 was said to have increased 151 percent, as compared with an increase in ton miles of about 28 percent.

Contract awards for heavy construction totaled \$5,642,060,000 for the first 22 weeks of 1952, compared with a total of \$6,255,842,000 for the comparable period of 1951, as reported by Engineering News-Record. There was a strong surge in public and highway construction during the latter part of May, while private construction showed a slight decline from preceding weeks.

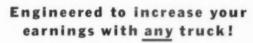
The Senate recently cut \$200,000,000 from a two-year authorization for federal highway funds. Other attempts to slash even more were defeated, however. The cut brought the authorization down to \$1,000,000,000.

THE EDITORS

Announcing

### A GREAT NEW LINE

of St. Paul hoists



Here is a quick "preview" of the greatest St. Paul line we've built in 40 years . . . 15 completely new models of hydraulic hoists with over 50 engineering improvements . . . 3 new lines of dump bodies, featuring stronger, wider side braces and more massive hardware . . . scientifically matched for all sizes and makes of dump truck chassis. Preproved by 24,000 dumps (equal to 12 years of normal service), these great new St. Paul hoists and bodies are ready to start increasing earnings on your trucks right now. See your truck dealer, or St. Paul Distributor for full details - or mail coupon for quick action.

10 to 31-ton cap. 4 NEW STANDARD-DUTY HOISTS 6 to 10-ton cap. 6 NEW CONVERSION HOISTS

- for platforms

...Brief facts

Up to 22% more payload capacity per dollar! Improved lifting leverages, combined with reduced dead-weight and new "friction-free" hydraulic power give you much greater capacity for your money in the new St. Paul line.

5 NEW HEAVY-DUTY HOISTS

Smoother performance...longer life! New all steel "uni-flex" sub-frames with sliding tension bars and rigid torque tube take critical strain off truck frame . . . equalize loads on strut arms for better alignment. Replaceable bushings provided at principal wear points.

15% to 50% lower installation costs! No re-work or major chassis alterations needed, since all new 51. Paul hoist components (except pumps) are above truck frame. Pre-drilled long beams, adjustable attaching brackets and dash mounted controls mean further savings.

Mail coupon for free booklet

Holsts . Dump Bodies . Refuse Loade Truck Patrols . Elevating End Gates

#### \_\_\_\_\_ ST. PAUL HYDRAULIC HOIST

Customer Service Department 36123 Main 3t., WAYNE, MICHIGAN

Send free backlet describing new
St. Paul hoists and dump bodies.

Employed by Address .... City

S-HBC-1

ROCK PRODUCTS, July, 1952

250,000 TONS of CLEAN MATERIAL IN 90 DAYS at Inland Construction Co.



Inland Construction Co.'s report sounds like a "Paul Bunyan" tale, but here are the facts. Complete plant set up in three weeks to take care of material for a large Air Base contract. Over 250,000-tons of material, to specification, turned out in 90 days—trucks loaded out in 11/2 minutes.

Highlight of the plant is an Eagle 32' Double Water Scalping Tank for removing excess water from two 8" pump production—and preliminary classification, with an Eagle 84" x 22' long weir Fine Material Washer-Classifier-Dehydrator for final processing.

The Eagle Washer gave Inland split-hair control of fines, washed away extraneous matter and delivered material free of excess moisture to waiting trucks. Cost-cutting flow line production with minimum original investment. No wonder so many aggregate producers are turning to Eagle Washing and Classifying Equipment, to eliminate headaches. Eagle's long experience plus thousands of installations can benefit you!





#### **Price Controls the Cause of Greatest Confusion**

of all the controls put in effect by the federal administration as emergency legislation, price controls have done more than any other restrictive regulation to disrupt our economy. Price controls and their companion wage restrictions were supposed to combat inflation but the facts indicate that their real purpose could be either one of two things, neither of which is good.

It would seem that price control, which likely was not needed in the first place, is nothing more than an idea being sold the public to help support the administration's program. An illusion of necessity for them has been created and an effect is to make people think the government is taking positive steps to combat inflation. The way the economy is running, with competitive forces setting in now for over a year, the insistence of maintaining and extending price controls this long cannot help but make one wonder if the real purpose is not to have a permanent system of control over prices and wages as well.

The evidence—no sign of inflationary pressures for a year—would indicate we are in need of a quick return to free markets; instead, the controls have continued and we have waste and inefficiency in production and unfair interpretations of useless regulations that have cost industry and the tax-payer a fortune. It seems unthinkable, when commodities are selling below ceiling prices, that any industry must continue to pay the costs of record-keeping, calculation and reporting to satisfy the control authorities.

Confusion doesn't only prevail in business, because of price control, but we have some recent evidence right in the ready-mixed concrete industry that the Office of Price Stabilization is at least as confused.

#### O.P.S. Reverses Itself

The O.P.S. has just handed down a ruling that the highest price charged by a ready-mixed concrete producer in the base period is not his ceiling price if it included a heating charge for cold-weather concrete. A heating charge can be made only when heating service is required and is not available to a producer at other times of the year.

This interpretation reverses an unofficial interpretation given to a company more than a year ago and a regional interpretation of a year ago which was a written opinion that the ceiling price of a producer was the highest price at which he sold concrete during the base period. In the latter case, the producer had delivered concrete through-

out the base period with a 50 cent per cu. yd. heating charge added.

Another producer had, on his own, asked O.P.S. for a ruling on heated concrete and, as a result and without warning, the industry has found itself governed by an entirely unexpected regulation which has the effect of being a new law. It came without consulting the industry, which had an advisory committee duly appointed by O.P.S., and was written on the basis of a presentation by one industry member.

In spite of the fact that the General Ceiling Price Regulation definitely has established the maximum price charged during the base period as the ceiling, the new interpretation has the effect of putting the industry on a day-to-day ceiling. If the base period control price carries an advantage for the producer, he is in the position that he must in effect show that every day he must sustain the same costs and the same services as in the base period. But, on the other hand, he's caught if a price war, or low prices because of bad business, had established a base period price that turns out bad for him.

#### **Arbitrary Rulings**

Thus, an industry that suffered great financial loss by inability to secure adjustment in time for the higher cost of out-of-area cement when the government itself was responsible for local cement shortages, and which had, until very recently, no relief for railroad transportation cost increases and other cost rises beyond its control, has suffered another blow because of the arbitrary action of O.P.S.

It isn't so important whether or not a heating charge for concrete be justified, which may be open to question, but arbitrary rulings by individuals on points of law are a dangerous thing.

Our survey of business conditions in the January, 1952, issue of Rock Products showed competitive conditions to exist in the ready-mixed concrete industry in 1951.

Now, it is time to get rid of a bad law and back to free competition. It will take action by Congress but pressure by enough industries can bring action.

Bron Nordberg

# Steel

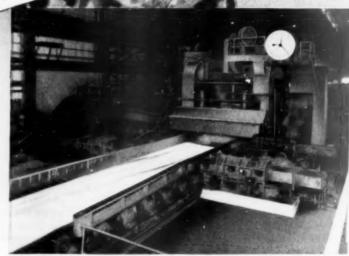
BULWARK OF FREEDOM AND ...



The changing pattern of progress, West of the Mississippi and East of the Rockies, is readily traced through the pages of Sheffield history.

First products of record were produced in 1888 to meet the needs of the great railroad building expansion. Following the rail lines came the fabulous development of agriculture, construction, mining, highways, manufacturing, oil and ship building. Each of these facets of industry presented needs for steel in different shapes and forms. In meeting such kaleidoscopic requirements, the Sheffield organization acquired a vast accumulation of skills, techniques and facilities and, today, produces a wider diversity of steel products than any other similar steel making set-up in the country.

Some phases of Sheffield Steel production have expanded 3½ times in the last 10 years while Sheffield's overall production has more than doubled.



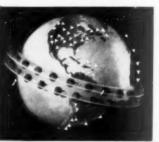
Fost and Powerful New Plate Mill—Fabricators of such steel products as pressure vessels, processing and storage tanks for liquids and gases, transportation line pipe, etc., require plate steel in far greater quantities than the slow cumbersome plate mills of yesteryear could produce. A new, powerful, 4-high plate mill at Sheffield's Houston works now rolls white hot slabs into long lengths of steel plate in a matter of minutes for shearing into sections to meet fabricators' needs.



SHEFFIELD

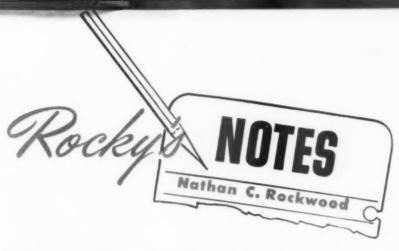
Grinding Balls

USED old PROVED



SCRAP MEANS ....

MORE STEEL FOR AMERICA More Money in Your Pocketi GET YOURS OFF TO



#### "Structural Chemistry of Inorganic Compounds"

THAT IS THE IMPRESSIVE title of two really impressive volumes recently off the press. Together they contain 1094 pages. The author, Dr. Walter Hückel, is a famous German scientist, and we presume that we are indebted to postwar conditions and thrifty publishers in Germany and the Netherlands (where the books were printed) for the English translation, which is one of numerous foreign authored technical works, that prior to the recent World War, had to be studied in German, if they were studied at all by most American or English scholars.

The publishers state that: "This book furnishes inorganic chemistry with that which organic chemistry has long possessed as a basis for its systematization-a structural constitutional theory on a single compre-hensive basis." Obviously, it is not light reading, but we believe there are some of our readers who would really like to be brought up to date on inorganic chemistry. We have relied much upon these volumes for our own understanding in preparation of an elementary discussion on "'Prospective' Chemistry of Cement and Concrete," begun elsewhere in this issue, although we do not profess to have absorbed much of the more specific mathematical and wholly technical material the volumes contain. However, taken in small or moderate doses, we believe many nonexperts will find this work profitable and suggestive reading.

It should be understood in advance that there is much the experts themselves are not too sure of, and that the exploration and discussion of new theoretical mineral structures is constantly going on. Judged by the list of references, cement and concrete research up to this time has not contributed much if anything to the fun-

damental theories of mineral structures, which probably accounts for the fact that no more progress has been made in determining the underlying causes of the faults of concrete.

The importance of using physical as well as chemical methods of analysis are emphasized by Dr. Hückel in the following quotation: "An uncertainty is really always inherent in the structural formulae of inorganic compounds obtained without the help of physical investigations. This can only be removed by the application of non-chemical methods of research. The formulae can supply valuable guidance concerning the use of these methods, and will be duly proved or rejected. By chemical means, if through the use of the principle of least possible structural change, they are at all successful, one usually obtains reaction formulae for a compound illustrating a mode of formation or double decomposition, or sometimes several. Frequently such reaction formulae have proved themselves to be unshakable in the face of a thorough physicochemical investigation, often, however, not."

That explains why X-ray and the electron-microscope are necessary to determine the actual structure of portland cement clinker, for example. Again quoting Dr. Hückel: "The establishing of an inorganic structural formula, however it is written, is scarcely ever as simple or convincing as in organic chemistry, and demands a much closer consideration of the most varied chemical and physical observations, as well as a careful weighing up of all arguments for or against any one of the alternate structures constructed on paper. The beginner, who cannot possibly have the correct feeling for the conclusiveness of this or that argument, must therefore approach inorganic structural formulae with an uncertainty that even the experienced investigator still possesses to a whole series of formulae for which experiments have so far yielded no adequate criteria." We would interpret that to mean that a certain amount of speculation, or supposition, is still involved in many mineral formulae, even in the case

of experts. Hence, in dealing with so complicated a mineral structure as cement clinker, we must expect speculation.

#### **Limitations of Chemistry**

However, students have to be reminded that chemistry alone will not solve many of the problems of inorganic chemistry. As our author puts "After mastering the preparative and analytical work, the structural chemist is completely at a loss and must satisfy himself with speculations which cannot be proved as long as he is not helped out by the physicist with his completely non-chemical method of X-ray analysis. The colloid chemist, on the other hand, can attain the goal he has set himself by a skilled combination of the most varied chemical and physical methods, and thereby solve the problem from the angle from which he sees it.' What cement and concrete research apparently has lacked is that "skilled combination," since a great number of investigations have been recorded both by chemists and colloid chemists or physicists.

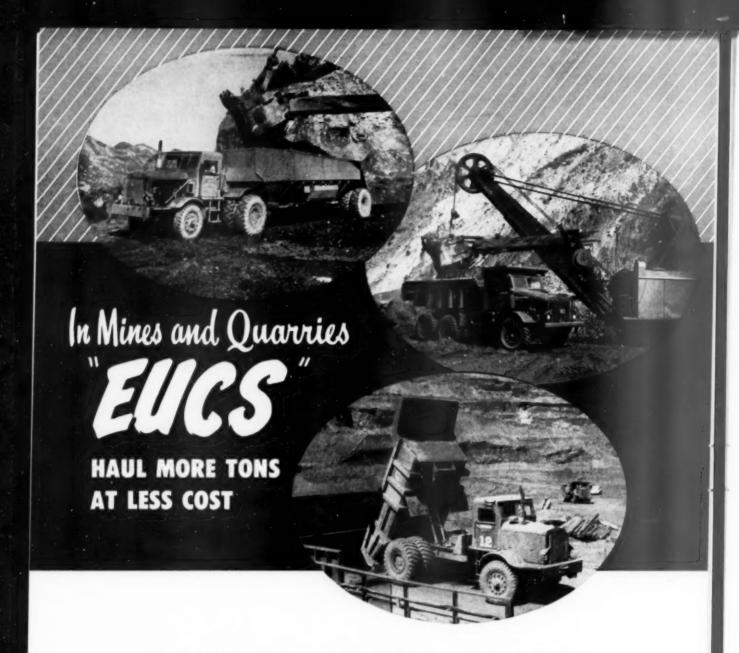
After all, the only purpose of either structural chemistry or colloid chemistry, in the study of cement, and concrete made with cement and inorganic or mineral aggregates, is to help explain such reactions as do take place in weathering or other deleterious conditions of exposure. Hence any discussion which will divert some attention and study from the results of specific investigations to a study of the basic phenomena involved should be helpful in achieving better and more consistently good concrete.

Even the most cursory examination of the volumes before us would convince a skeptic that we are a long way from a technical description of a portland cement in merely tabulating the alleged percentages of C.S. C.S. C.A and C.AF. And while X-ray methods have been employed in the study of portland cement clinker these many years, they have been used, so far as we can see, chiefly to identify crystals of these various mineral compounds. According to Dr. Hückel, structure analysis by X-ray can be used to obtain the following data: "(1) distance between the nuclei [of the atoms or ions]; (2) spatial arrangement of the valence electrons; (3) strength of binding of the electrons; (4) strength of the binding of the nuclei; (5) behavior of the valence electrons during perturbations."

All that may sound complicated and incomprehensible at the moment, and we mention it here only to prove that any study of the fundamental causes of concrete failures or successes is going to involve a great deal more applied science than it has had up to the present time. The big problem of those who are engaged or are to be engaged in this kind of research

(Continued on page 94)

"Structural Chemistry of Inorganic Compounds" by Dr. Walter Hückel, translated by Dr. L. H. Long, published by Elsevier Publishing Co., Inc., New York, Amsterdam, London and Brussels, Vol. I, Stoichiometry and Systemization: Atomic Structure and Chemical Bonding, Price 39,09, Vol. II, Structure and Constitution of Many Known Substances (Inorganic). Price 31,25,96, Both can be obtained from the Elsevier Press, 402 Lovett Blyd., Houston, Texas; or from the publisher's New York City office, 309 Park Ave., New York, N.Y.



Built for tough off-the-highway hauling, Rear-Dump and Bottom-Dump "Eucs" have stepped up production and cut hauling costs on hundreds of open pit mining and quarry operations.

Euclids have proved their efficiency and long life in hauling a wide variety of materials...coal, ore, rock, overburden and other heavy excavation. Bottom-Dumps are powered by diesel engines of 190 to 300 h.p....loaded speeds up to 34.4 m.p.h... available in 20 to 40-ton capacities. Rear-Dump "Eucs" have travel speeds up to 36.3 m.p.h.... powered by diesel engines of 125 to 400 h.p. ... range in capacity from 10 to 34 tons.

Your Euclid Distributor has performance data on jobs similar to yours. Ask him for a Euclid hauling cost estimate — there's no cost or obligation.

The EUCLID ROAD MACHINERY Co. . CLEVELAND 17, OHIO



### LABOR RELATIONS TRENDS

Various Important Decisions and Prospective Legislation

By NATHAN C. ROCKWOOD

THE DECISION OF THE UNITED STATES SUPREME COURT in voiding the President's seizure of the steel industry plants overshadows some other decisions of little less interest to our industries. That decision, of course, is likely to have many repercussions, for at this writing Congress is debating various bills introduced for the purpose of (1) giving the President power to seize industries under similar circumstances; (2) specifically to deprive him of any such authority in the future; (3) make the President enforce the Taft-Hartley Act. Whatever action, if any, is finally taken by the Congress, it would appear that collective bargaining between labor and management may be further circumscribed. The whole situation should teach both labor union bosses and management that the less government in their disputes, the bet-

#### Collective Bargaining Law

In an address before a recent labormanagement conference at the University of West Virginia, Paul L. Styles, member of the National Labor Relations Board, summarized the present legal status of collective bargaining as follows:

"(1) The board and the courts have frowned upon employer failure to meet with the bargaining representative with reasonable promptness or at a reasonable meeting place, or at his engaging in delays or evasions.

"(2) The board and the courts have found the employer acting in bad faith where he has adopted the stratagem of keeping the bargaining agent in constant doubt as to the authority of the employer's negotiators.

"(3) The board has found both employers and unions guilty of bad faith when they have refused to reduce the agreement to a written and signed document of reasonable duration.

"(4) The board has found unions guilty of bad faith where they have insisted upon illegal clauses.

"(5) The board and the courts have construed the intent of the statute to be frustrated where the employer utilizes individual contracts to forestall collective bargaining. However, both the board and courts have held that individual bargaining may be legal so long as it is not undertaken for the purpose of avoiding the collective bargaining obligation. The Supreme Court has clearly stated: Where there is great variation in circumstances or capacity of employes, it is possible for the collective bargain to prescribe only minimum rates or maximum hours or expressly leave certain areas open to individual bargaining.

"(6) It has also been repeatedly held that an employer cannot undertake to change conditions of employment without prior consultation with the exclusive bargaining representative. However, there is one area where the employer can make a change unilaterally despite the presence of a bargaining agent. This situation is one in which the employer, in good faith, has reached an impasse on a particular issue with the bargaining agent. When such impasse has been reached, the employer is free to extend directly to his employes the offer which has been rejected by the union. However, in making this unilateral change, the employer may not go beyond his best offer to the bargaining agent.

"(7) The extent of the obligation to bargain during the term of a contract also has presented a problem in some cases under the present law. The continuing obligation under the Wagner Act to bargain on all questions whether or not they are covered by a contract is changed: Parties to an agreement, under the Taft-Hartley Act, are relieved of the duty to discuss or agree to any modifications of terms of a contract if such modification is to become effective before the contract can properly be opened."

#### Status of Contract Truckers

A decision of the U.S. Circuit Court of Appeals, Eighth Circuit (St. Louis, Mo.) on May 6 has a bearing on the employment of independent or so-called contract truckers who own their own trucks. There are many such cases in the rock products industries. This particular case involves an Arkansas lumber company. (Tobin, etc. vs. Anthony Williams Manufacturing Co., Inc.) The questions at issue were stated in the court's decision as follows:

"On the appeal there are two distinct questions for consideration: (1) were certain truck drivers and woods workers 'employes' of the defendant within the meaning of the Fair Labor Standards Act, or were they independent contractors, as contended by the defendant, and as was held by the trial court; and (2) did the District Court err in refusing to issue injunction against defendant in respect to overtime, record-keeping and shipment requirements of the act?"

The lumber company owned the land and contracted with independent truckers to cut and haul the logs to the mill. The finished lumber products entered interstate commerce. The truckers owned their trucks and the lumber company paid for the logs hauled at a certain rate. The case was a little unusual perhaps in that the company had previously own-

ed the trucks and employed the drivers as its own employes. The drivers consequently were paying off for the trucks by a deduction of \$2 per 1000 b.f. of logs hauled. The contract for the "sale" of the trucks to the drivers specified they were to be used exclusively in hauling the company's logs. The tree-cutting and log hauling were directed by a foreman for the company. The truckers employed the wood cutters and furnished the necessary axes and saws.

The Appeals Court decided: "Applying that general test, we think that the haulers and woods workers in this case must be held to be employes. Defendant, in effect, controls their activities. They are directed where and what to cut. The amounts of their deliveries are determined by the work of defendant's loader and by the capacity of defendant's storage facilities. The haulers have no substantial investment in their trucks, and their ownership is no more than nominal. They cannot use the trucks for other than defendant's business, even on days they are not working for defendant. Defendant does not furnish the woods workers with saws and axes, but the teams necessary are furnished and owned by defendant. The haulers have small chance of any large financial return, and do not incur losses. Admitted employes perform identical work."

Whether or not there are any similar cases in the rock products industries, the facts given should be helpful in avoiding such contracts.

#### Walsh-Healey Act Changes

In our May issue, page 53, we warned against the intention of the Secretary of Labor to extend the Walsh-Healey (Public Contracts) Act in ways that probably would have been embarrassing to many of our readers. Fortunately, there were so many vigorous protests from industry both to the Labor Department and to Congressmen that the Secretary of Labor decided to postpone the scheduled June 10 hearing indefinitely. The protests were said to be centered primarily on the provisions to make prime contractors responsible for seeing that their supplier subcontractors were conforming to the act. This proposal was attacked on the floor of Congress as extending the act beyond the original intent of Congress. The Labor Department afterward released an announcement that read:

"Secretary Tobin stated that he had received many letters protesting the proposal to hold prime contractors liable for violations of the act which might occur in the plants of their secondary manufacturers. As a result of these comments, the Secretary has decided that before holding a hearing further study should be undertaken in the department to explore the possibility of relieving prime

(Continued on page 94)

# ow in first FOR SAND AND GRAVEL STONE PLANT MEN AERO-VIBE SCREENS

Aero-Vibe screens are also profitable for sizing or rinsing medium-coarse materials up to 3-in. feed size. Built in 2 x 4 to 5 x 10-ft sizes, open or enclosed, 1 to 3 decks.

YOU'LL GET profitable fine screening with Aero-Vibe screens — low in first cost and low in operating cost! They're engineered to give you the same sturdiness and low maintenance that are typical of other Allis-Chalmers vibrating screens.

Aero-Vibe screens are so efficiently designed and so soundly built they've been operated successfully at speeds up to 2000 rpm! High speed gives you a spanking vibration that puts more fines through your screen — with less in the oversize. Vibration is easily adjustable. You just change the position of circular counterweights at shaft ends.

Find out how Aero-Vibe screens can save dollars in your operations. Call the A-C representative in your area, or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Aero-Vibe screen Bulletin 07B6099.

Aera-Vibe is an Allis-Chalmers trademark



### **ALLIS-CHALMERS**



......



Vibrating Screens



Jaw Crushers



Gyratory Crushers



Grinding Mills



Kilns, Coolers, Dryers

Sales Offices in Principal Cities in the U.S.A. Distributors Throughout the World.

# PEOPLE in the news

#### Ideal Personnel Changes

HARLEY FLEMING has been appointed Gulf division superintendent of Ideal Cement Co., Denver, Colo., with headquarters in Houston, Texas. He was formerly plant manager, Gulf division, and will be succeeded in this position by J. L. Conerly, formerly assistant plant manager. Hugh L. Conner, who has been plant manager, Three Forks division, Trident, Mont., has been made plant manager, Ala-bama division, Mobile, Ala. Charles S. Burriss succeeds Mr. Conner as plant manager, Three Forks division. He was formerly assistant plant manager. V. E. Wessels, formerly plant manager, Mobile, Ala., has been appointed assistant to Thomas B. Douglas, production manager, production department, Denver, Colo.

#### Marietta Concrete Corp. Officers Re-Elected

FRANK L. CHRISTY has been reelected president, general manager and director of The Marietta Concrete Corp., Marietta, Ohio, Frank J. McCauley was re-elected vice-president; C. B. Ross, vice-president in charge of the Baltimore, Md., plant, and Charles D. Fogle, secretary. F. Leonard Christy was elected vicepresident of sales and advertising; R. Neil Christy, vice-president of production and engineering, and C. K. Smith, treasurer.

#### Returns from Brazil

CARL J. LOFSTEDT, consulting engineer, formerly general superinten-dent for Lone Star Cement Corp. in South America, has recently returned from a tour of inspection for Erle P. Halliburton, president of Halliburton Portland Cement Co., and Cia Brasiliera de Ligantes Hidraulicos, for the contemplated erection of a 4000-bbl. cement plant at Macaé, Brazil. According to Mr. Lofstedt, the unique features of the plant will be the pumping of limestone slurry 50 miles from the raw deposit to the coast and the installation of a hydroelectric plant to furnish power for the quarry, crushing and raw grinding departments.

#### **Development Engineer**

LAWRENCE D. CHILDS, former research engineer with the Michigan State Highway Department, has joined the Portland Cement Association as a senior development engineer in the transportation development sec-

tion. Mr. Childs received his A. R. degree in physics and mathematics from Albion College, and his M. A. degree in these same subjects from Michigan State College. He has taught engineering subjects and mathematics at Ripon College and at Michigan State College. While with the Michigan State Highway Department, he conducted research and authored papers on highway development projects, principally in connection with concrete pavement design.

#### Materials Consultant

Dr. F. O. Anderegg, who has been a contributing editor on ROCK PROD-UCTS' staff for many years, has resigned as director of building materials research, John B. Pierce Foundation, Raritan, N.J., to form his own consulting service on building materials at R. D. 3, Somerville, N.J. Dr. Anderegg is an active member of the American Society for Testing Materials and at present is serving as chairman of Committee C-3 on Chemical-Resistant Mortars and vicechairman of Committee C-12 on Mortars and Unit Masonry.

#### Division Sales Manager

H. M. VANCLEVE, who for some years has been district sales manager in the Syracuse, N.Y., office of The General Crushed Stone Co., Easton, Penn., has been promoted to division sales manager in charge of sales for the plants in Watertown, Lacona, Jordanville, Auburn, Rock-Cut, Fayetteville, Jamesville, Etna, Horseheads and Corning, N.Y. Mr. VanCleve joined the company in 1933 as district sales manager at the Horseheads plant. Subsequently he was connected with sales at the plants at Geneva, N.Y., Wilkes-Barre, Penn., and recently Syracuse, N.Y., where he will continue his headquarters. W. R. Smallwood has been named district sales manager at the Jordanville plant, and C. A. Blowers has been appointed district sales manager at the Horseheads and Corning plants.

#### On Board of Directors

CRIS DOBBINS, president of Ideal Cement Co., Denver, Colo., has been elected to the board of directors of Pacific Portland Cement Co., San Francisco, Calif. M. O. Matthews, executive vice-president of Ideal, has also been elected to the board. J. A. McCarthy, T. W. Rosebaugh and J. Shoening, Jr., have been retained from last year's board of directors.

#### A.S.T.M. Treasurer

ROBERT J. PAINTER has been appointed treasurer of the American Society for Testing Materials, Philadelphia. Penn., in addition to his duties as assistant secretary. He succeeds John K. Rittenhouse, who has retired after 43 years of service with the society. Dorothy P. Douty has been named assistant treasurer. Mr. Painter, who has been on the A.S.T.M. staff since 1931, will continue as associate editor of the A.S.T.M. Bulletin.

#### Directs Newfoundland's **Development Plan**

SIR WILLIAM STEPHENSON, chairman of The Cement Co. of Jamaica, has been appointed chairman of the Newfoundland and Labrador Corp., a government corporation formed to develop the vast area in Newfoundland and Labrador, including timber limits, mineral and oil rights and potential hydroelectric horsepower. In addition, the corporation will absorb existing government-run industries, including cement, gypsum, steel mills, etc. It will be the policy of the Newfoundland and Labrador Corp. to develop natural resources and industry, and to turn these over to private enterprise. Dr. Alfred Veldmanis is president and principal executive officer of the corporation, and Leslie R. Curtis, attorney general, is secre-

#### **Engineers Elect Officers**

L. H. STOTT has been named vicepresident and manager of the engineering department of Robert W. Hunt Co., engineers, Chicago, Ill. S. C. Sexauer has been appointed secretary-treasurer, and W. F. Anderson, assistant secretary-treasurer. These changes were occasioned by the recent death of D. W. McNaugher, Jr., who was vice-president and treasurer.

#### Named President

HAROLD M. WHITAKER has been appointed president of Whitaker and Mattson, Rapid City, S.D., manufacturer of Bartile concrete roofing tile. The company has received a franchise from the National Bartile Roof Corp. to distribute this product in Butte, Lawrence, Meade, Pennington, Custer, Fall River, Harding, Perkins, Zieback, Haakon, Jones, Lyman, Tripp, Millette, Washabaugh, Bennett and Shannon counties. officers of the firm are W. A. Mattson and W. A. McCullen.

#### **Appointed Vice-President**

W. A. HAZELETT has been appointed vice-president and general manager of the Union Rock and Materials Co., Phoenix, Ariz. He has been sales manager for the past two years. A native of Arizona, Mr. Hazelett is a graduate of Phoenix Union High School, Phoenix Junior College and Woodbury College at Los Angeles. He was formerly associated with Cement Products, Inc., and was president and general manager at the time the company was sold.

#### C. of C. Board Member

Frank E. McCaslin, president of the Oregon Portland Cement Co., Portland, Ore., and past president of the Portland Chamber of Commerce, has been elected a member of the board of directors of the United States Chamber of Commerce. He will represent district No. 10 comprising the states of Oregon, Washington and California. Mr. McCaslin has been serving on the National Resources Committee and as chairman of the joint Canadian-United States Committee of the U.S. Chamber of Commerce.

#### **Guest Speaker**

DR. A. ALLEN BATES, vice-president for research and development, Portland Cement Association, Chicago, Ill., was guest speaker at a recent meeting of the Associated General Contractors of St. Louis. He told the leaders of the construction industry that war and its accompanying debts could cause inflation, while no war and cessation of armament could just as easily bring about depression. A deliberately-planned construction boom, nationally-coordinated and scaled, was the alternative suggested by Dr. Bates. Highways, housing, conservation and slum clearance projects should be developed to serve our rapidly-growing population. And the job will be too big for private investment alone to handle, he added.

#### **Elected a Director**

IRVIN L. CLYMER, president of the Michigan limestone division of United States Steel Corp., New York, N.Y., has been elected a director of Peerless Cement Corp., Detroit, Mich.

#### Sales Representatives

Joseph Angelo, sales representative in the Fresno-Bakersfield area of Kaiser Gypsum, division of Henry J. Kaiser Co., Oakland, Calif., has been transferred to Sacramento. George Steele, formerly in the order department in Oakland, replaces Mr. Angelo in Fresno, and Vince Maloney, formerly in the Redwood City plant, succeeds Mr. Steele in the Oakland order department.



H. F. Sadler

#### **Association Vice-President**

H. F. Sadler, vice-president in charge of sales for United States Gypsum Co., Chicago, Ill., was elected first vice-president of the Gypsum Association at its recent annual meeting in Chicago. Noel J. Redmond of Los Angeles was elected president; James E. Holbrook of San Francisco, second vice-president, and James Bale of Grand Rapids, Mich., treasurer. Lloyd H. Yeager of Chicago was re-elected general manager.

#### **Lehigh Appoints Officers**

P. A. Groll has been named vicepresident and assistant general operating manager of Lehigh Portland Cement Co., Allentown, Penn. Ralph L. Browning has been appointed vicepresident and assistant general manager of sales; and R. O. Erdman, vice-president of purchases.

#### **Assistant Manager**

G. E. Boatwright, a sales representative in the Kansas City branch of The Celotex Corp., Chicago, Ill., has been appointed assistant manager of the branch.

#### Merchandise Manager

C. B. ALVORD, head of the defense materials department of United States Gypsum Co., Chicago, Ill., has been appointed merchandise manager of the company's new industrial merchandising department. Previously he was Northwest district sales manager of industrial products.

#### Traffic Manager

LLOYD W. GRAGG has been appointed traffic manager of Kaiser Gypsum, division of Henry J. Kaiser Co., Oakland, Calif., succeeding Jay Barbeau, who has resigned.

#### **Assistant Manager**

J. ROBERT D. BROWN has been appointed assistant manager of the Accident Prevention Bureau of the Portland Cement Association, Chicago, Ill. He has been a member of the bureau since 1946. Prior to joining the P.C.A., Mr. Brown served as assistant chief of civilian personnel and safety in the Sixth Service Command of the U. S. Army, and had been in safety work for the U.S. Office of Education and the National Safety Council.

#### **Association Speaker**

DONALD H. McLAUGHLIN, past president and director of the American Institute of Mining and Metallurgical Engineers, was the keynote speaker at the recent convention of the New Mexico Mining Association in Carlsbad, N.M. Mr. McLaughlin is chairman of the advisory committee on raw materials for the Atomic Energy Commission. T. M. Cramer, vice-president of United States Potash Co., Carlsbad, is president of the New Mexico Mining Association.

#### **District Sales Manager**

HARDY MAGRATH has been appointed district sales manager at the Jacksonville, Fla., office of Lehigh Portland Cement Co., Allentown, Penn. He was formerly district sales manager at Birmingham, Ala., and will be succeeded in this position by W. D. Garvin, formerly a representative at Atlanta, Ga.

#### **Cement Consultant**

R. C. RIED, who recently resigned as a partner in Knowles Associates, is continuing as a consultant in the nonmetallic minerals industries, specializing in cement, under the firm name of R. C. Ried—Engineers, New York, N.Y.

#### **District Sales Manager**

C. T. JOHNSON has been appointed district sales manager in charge of the Wilkes-Barre, Penn., office of The General Crushed Stone Co., Easton, Penn., which handles the sale of bituminous concrete and crushed stone produced at the White Haven plant. Mr. Johnson was formerly materials engineer for the Scranton and Allentown districts of the Pennsylvania State Highway Department. He joined The General Crushed Stone Co. in 1946 as assistant district sales manager in charge of bituminous concrete and crushed stone sales in the territories served by the plants at Horseheads, Corning and Etna, N.Y. A. G. Barres, who has been with the company for almost 50 years, has been appointed district sales engineer in the Wilkes-Barre office, and will serve as consultant to Mr. Johnson.

#### **Appointed Vice-President**

W. F. CAPPS has been appointed vice-president and sales manager of the West Lake Ready-Mix Concrete Co., Inc., Clayton, Mo., which is affiliated with the West Lake Quarry and Material Co. Mr. Capps was formerly a salesman for the Fabick Tractor Co. V. R. Cruse is president of the company and Mrs. Lillian Trump is secretary.

#### Joins Sales Staff

WILLIAM SIEGERT, formerly with Economy Block Co., has joined the sales staff of the Best Block Co., Milwaukee, Wis.

#### Speaks on Concrete

M. E. Bender, structural engineer for the Harrisburg, Penn., district of the Portland Cement Association, Chicago, Ill., gave a talk on prestressed concrete at a recent meeting of the Altoona Engineering Society. The subject of Mr. Bender's talk, which was arranged for by Robert Over of the New Enterprise Stone and Lime Co., was a discussion of "Applications of Prestressed Concrete."

#### On Executive Committee

ERNEST M. HAMMOND, president of Gravel Products Corp., Buffalo, N.Y., has been elected to the executive committee of the General Contracting Employers' Association of Buffalo.

#### **Association President**

Adolph C. Bromgard, secretary-treasurer and general manager of Lohof Brothers Co., Billings, Mont., has been elected president of the Montana Ready Mixed Concrete Association. He was formerly vice-president. Other officers are Oscar Peterson, Butte, vice-president, and Eugene Fehlig, Helena, secretary-treasurer.

#### Sales Engineer

WILLIAM H. SPRANG, formerly with the Illinois Division of Highways, has been appointed sales engineer at the Pittsburgh, Penn., office of Universal Concrete Pipe Co., Columbus, Ohio.

#### General Manager

HENRY MILLER, formerly sales manager, has been appointed general manager of the Arizona Precast Concrete Co., Mesa, Ariz.

#### **Appointed General Chemist**

CHARLES H. DICKENS, formerly assistant plant manager at the Waco, Texas, plant of Universal Atlas Cement Co., has been appointed general chemist in the New York office. Mr. Dickens had been assistant plant manager at the Waco plant since 1948, and prior to that served as chief chemist there for 19 years. He joined the

cement company in 1922 at its Independence, Kan., plant, serving there as laboratory assistant and assistant chemist until 1929 when he went to the Texas plant as chief chemist.

#### In Partnership

N. V. S. Knibbs and E. G. S. Thyer have formed a partnership as consulting chemical engineers in Westwood, England. Dr. Knibbs, who has contributed articles to Rock Products, is author of the book "Lime and Magnesia."

#### Joins Silica Firm

GARNET G. COPELAND has been appointed vice-president and general manager of the Dominion Silica Corp., Ltd., Montreal, Canada. He was formerly with the FluoSolids division of the Dorr Co.

#### **Heads Engineering Society**

EDWARD J. NUNAN, materials engineer and sales manager for the New York area of the Buffalo Slag Co., Inc., Federal Crushed Stone Corp., and Hornell Gravel Corp., Buffalo, N.Y., has been elected president of the New York State Society of Professional Engineers. He is a past president of the Erie county chapter of the society and a member of the Erie County Planning Association.

#### **Elected Directors**

J. A. McCarthy, president, and J. H. Colton, vice-president, of Pacific Portland Cement Co., San Francisco, Calif., have been elected directors of Ideal Cement Co., Denver, Colo. Also elected directors are Marshall P. Madison and Norman G. Nicholson.

#### A.S.T.M. Director

M. A. SWAYZE, director of research, Lone Star Cement Corp., New York, N.Y., has been elected a member of the board of directors of the American Society for Testing Materials for a term of three years.

#### Secretary-Treasurer

A. WAYNE IRWIN has been elected treasurer of United States Gypsum Co., Chicago, Ill., in addition to his duties as secretary. He succeeds C. H. Shaver, chairman of the board, who has relinquished the position of treasurer.

#### **Appointed Vice-President**

WILSON C. HANNA, chief chemist, California Portland Cement Co., Colton, Calif., has been appointed vicepresident in charge of technical development.

#### Sales Manager

A. W. Scott has been appointed sales manager of the metropolitan sales division of Lone Star Cement Corp., New York, N.Y.

#### Wins Display Award

FREDERICK W. REINHOLD, president, Anchor Concrete Products, Inc., Buffalo, N.Y., was recently presented a plaque as first prize for his company's display at the Buffalo Better Homes Exposition. The presentation was made by G. Lawrence Mitchell, president of the exposition.

#### **Vice-President Retires**

George W. Goelitzer, vice-president of Cinder Concrete Products, Kansas City, Mo., has retired after 27 years of continuous service with the company. A native of Kansas, Mr. Goelitzer became auditor in 1925 and was named vice-president in 1935. G. R. England, formerly Kansas salesman, has been named sales manager.

#### **Consulting Geologist**

Dr. Poole Maynard has been appointed consulting geologist for the Atlantic Coast Line Railroad Co., Wilmington, N.C., with headquarters at Atlanta, Ga.

#### OBITUARIES

W. K. HATT, a pioneer in cement and concrete research, died at Birmingham, Mich., recently. He was 84 years old. Mr. Hatt was former head and founder of the school of civil engineering, Purdue University. He had retired in 1937 after 44 years with the school. A former state engineer and former president of the American Concrete Institute, Mr. Hatt was a consulting engineer for Hoover dam and other projects.

C. OLIVER CRABB, president of Mc-Kenna, Jones and Crabb Gravel Co., Norfolk, N.Y., died in Daytona Beach, Fla., recently while vacationing with his wife. He was 53 years old.

J. M. Parrish, founder and former president of the Concrete Pipe and Products Co., Inc., Richmond, Va., died recently on a train enroute from Tucson, Ariz., where he had been visiting his son, Wade Allen Parrish. He was 59 years old.

EARL A. FOUST, plant superintendent for The Marietta Concrete Corp., Marietta, Ohio, died recently.

LESTER E. SCHWALBE, president and founder of Economy Block Co., Milwaukee, Wis., died recently at his home in Wauwatosa. He was 56 years of age. Mr. Schwalbe settled in Milwaukee 31 years ago, when he founded the concrete products firm. He was a member of the Wisconsin Concrete Products Association and the National Concrete Masonry Association, and formerly served as a member of the board of directors of the N.C.M.A.

# TEXACO SIMPLIFIED LUBRICATION PLAN SPEEDS O'HARE FIELD CONSTRUCTION...



AT WORK ON O'HARE FIELD: Texaco Lubricants and Fuels were used exclusively. Equipment included: 10 Le Tourneau Tournapulls, 6 Caterpillar Motor Patrols, 2 HD-20 Allis-Chalmers Tractors with Gar-Wood Bulldozers, 5 D-8 Caterpillar Tractors with 18-yd. scrapers, 2 HD-20 Caterpillars, 8 shavels with 2-yd. buckets, 8 road rollers, 4 air compressors, 2 trenchers, and 20 trucks.

#### Here's what the contractors say:

"The saving of time and elimination of guesswork by using the Texaco Simplified Lubrication Plan were important contributing factors in completing the contract on schedule. Using the proper lubricants has paid us big dividends."

- J. M. Corbett - M. J. Boyle Co., Chicago, Illinois

The job was constructing some 130,000 square yards of stone base runways, 21 and 27 inches thick, at U. S. Air Force O'Hare Field Base Extension, Park Ridge (Chicago), Illinois. Since this is a very active base, the job had to be done without disrupting normal operations. Work, therefore, had to be coordinated and peak performance maintained to assure completion within the limited time allotted.

All equipment on the job was lubricated and fueled exclusively with Texaco. The Texaco Simplified Lubrication Plan — which calls for *only six* Texaco Lubricants to handle all major lubrication — greatly speeded up the maintenance of equipment, and the high quality of Texaco Lubricants assured dependable, efficient performance.

Products Used in Texaco Simplified Lubrication Plan

1. ENGINE LUBRICATION: Use Texaco Ursa Oil X\*\* for both heavy-duty gasoline and Diesel engines. Fully detergent and dispersive, it keeps engines clean, protects against wear, rust and corrosion. Reduces maintenance costs and fuel consumption. 2. CHASSIS LUBRICATION: Use Texaco Marfak. It won't jar or squeeze out of bearings, gives longer

lasting protection against dirt, rust, wear. More than 400 million pounds of Texaco Marfak have been sold! 3. WHEEL BEARING LUBRICATION: Use Texaco Marfak Heavy Duty. It seals out dirt and moisture, seals itself in — assuring longer bearing life and safer braking. No seasonal change required. 4. CRAWLER TRACK LUBRICATION: Use Texaco Track Roll Lubricant. It gives long-lasting protection against dirt, water and wear. Reduces maintenance costs. 5. AIR COMPRESSOR LUBRICATION: Use the Texaco air compressor oil recommended to exactly suit your operating conditions. 6. ROCK DRILL LUBRICATION: Use Texaco Rock Drill Lubricant EP. It gives superior protection against wear, prevents rust whether drills are running or idle.

Let a Texaco Lubrication Engineer show you how the Texaco Simplified Lubrication Plan can be adapted to your particular job conditions—can save you time and money on every project. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

**TEXACO** Lubricants and Fuels





#### **Distribution Plant**

LEHIGH PORTLAND CEMENT Co., Allentown, Penn., recently purchased property at Commodores Point, Fla., for the establishment of a bagging and distribution plant for the firm's new cement plant nearing completion at Bunnell, Fla. The distribution plant will include five storage silos, each approximately 25 ft. in diameter and 100 ft. in height. The plant site has a river frontage of about 125 ft. Preliminary work on the project has been done by Robert M. Angas and Associates, a Jacksonville, Fla., engineering firm. Cement will be brought from the Bunnell plant by barge.

Lehigh has opened a district sales office in Commodore Point. Hardy McGrath, who was transferred from the company's Birmingham, Ala., plant has been named the new district sales manager.

#### Safety Celebration

THE KELLEY ISLAND LIME & TRANSPORT Co. recently held a testimonial dinner in honor of 40 employes of its Buffalo, N.Y., plant, who successfully completed a safety program in 1951 without a lost-time accident. The Buffalo plant competed with three company plants in Ohio and one in Michigan.

J. V. Andrews, manager of operations, Cleveland, Ohio, presented each employe of the winning plant with an award. A trophy won by the Buffalo plant was also presented.

#### **Lightweight Aggregates**

THE BUREAU OF MINERAL RE-SEARCH, Rutgers University, has been testing various New Jersey materials as possible sources of lightweight aggregates for use in cinder block and other concrete products. Available supplies of cinders in New Jersey have been dwindling rapidly since the great construction boom of the postwar years. It was stated that unless some suitable cinder substitute could be found, the approximately 200 plants making cinder block, at the rate of about 1,000,000 per day, would have to close down within three to five years.

The bureau, which is primarily interested in greater utilization of New Jersey's mineral resources, started work on the problem about a year ago. Forty-two samples of New Jersey minerals, from all parts of the state, were tested. Shales, certain clays and trap rock, all abundant in New Jersey, were found suitable for lightweight aggregate production.

Further research is now being carried on to evaluate the quality of the material and economical factors involved.

#### Record Highway Bill

Congress, on June 11, despite administrative demands for a reduction, passed an all-time-high federal aid highway bill, with regular federal aid authorizations for state participation amounting to \$575,000,000 for each of the fiscal years 1954 and 1955. In addition, the bill provides \$50,000,000 for access roads and \$10,000,000 for an emergency fund.

The controversial provision permitting the transfer of funds from the secondary to the primary system, and vice versa, was eliminated in conference. Also, a new provision in federal aid legislation sets up for the first time a special fund for the development of the interstate system. The measure provides \$25,000,000 per year for this purpose and directs that allocation be made on the same basis as the provision governing funds for the federal aid primary system. Much of the success of this measure can be attributed to the American Road Builders' Association which had strongly advocated the establishment of a special fund to expedite the improvement of the interstate system. Although authorizations in the new highway bill are less than A.R.B.A.'s recommendations, they are still almost more than could be hoped for in view of the demands by the administration and other sources for a substantial reduction.

The measure now goes to the President for approval. In view of the administration's stand, a presidential veto of the measure would not be unexpected.

#### To Open Potash Mine

MIDLAND CO-OPERATIVE WHOLESALE plans to start open-pit mining of potash deposits in Idaho, as recently announced by A. J. Smaby, general manager. He stated that with other cooperatives, Midland plans eventually to build a plant at the Idaho deposit at a cost estimated between \$13,000,000 and \$15,000,000.

#### **Opens Branch Office**

FISCHER LIME & CEMENT Co., Memphis, Tenn., has opened a branch office and warehouse at North Little Rock, Ark., to serve customers in Arkansas, southern Missouri, northern Louisiana and sections of Texas and Oklahoma.

#### Strikes Cause Local Cement Shortage

A CRITICAL CEMENT SUPPLY situation, affecting road and building construction, has been reported in the Milwaukee, Wis., area. Most of the cement for this area was previously supplied by Universal Atlas Cement Co.'s plant near Gary, Ind. The cement company is a subsidiary of U.S. Steel Corp. and its Gary cement plant has been closed during the steel strike.

In addition to the steel strike, a strike at Medusa Portland Cement Co. plants has deprived the Milwaukee area of cement supplies normally received from these plants. Also, some cement that normally would have been shipped to Milwaukee was diverted elsewhere during a month-long building-trades strike which just ended in May.

#### **Engineer Expands Services**

ATHERTON & EVANS, Annville, Penn., consulting engineers serving the lime industry, are broadening their activities to include the design of crushed stone and sand and gravel plants. The firm's experience in lime plant design, including quarry layout, forms the basis for this expansion of service into these fields to include preliminary study, specification of equipment, detailed design and assistance in plant installation.

#### **Vermiculite Plant**

ZONOLITE Co., Chicago, Ill., has opened a vermiculite processing plant in Wilder, Ky. The new plant will process vermiculite ore from the company's mines in Libby, Mont., and Travelers Rest, S.C., for distribution in northern Kentucky, southern Indiana and southern Ohio.

#### **Cover Picture**

COVER PICTURE on this issue shows an extra high bank of material be-

ing worked in Utah. The sand and gravel operation is that of Utah Sand and Gravel Products Corp., Salt Lake City, Utah. In addition to its aggregate operations, the compared of the same of the same



pany also owns a ready-mixed concrete plant in Salt Lake City.

#### **Cement-Aggregate Studies**

THE APRIL, 1952, issue of Highway Research Abstracts contained a summary of studies made on the cementaggregate reaction of Australian aggregates and cements. In the tests, 67 aggregates were made into mortar bars with cements selected from a series of 16 obtained from ten Australian manufacturers. Both high and low alkali cements were used with each aggregate, and a reactive siliceous magnesian limestone from California and an inert quartz sand from England were used with each cement for purposes of comparison.

The test bars were stored in moist air at room temperature for up to two years. Expansion and damp reactive spotting were correlated with the petrographic characters of the aggregates. The following results were listed: damp spots, if present in only small numbers, could be unaccompanied by marked expansion; materials favoring marked expansion were opal, a mineral of refractive index 1.55 termed cryptocrystalline quartz rather than chalcedony and, in acid or intermediate hypabyssal or volcanic rock, glass; basic volcanic and hypabyssal rock, free from weathering or secondary silification, appeared to be particularly safe aggregates; the three fresh granites examined were satisfactory; rock from the arid central regions of Australia may be opaline and prove dangerous; and it was concluded that although the use of low alkali cement with reactive aggregates may modify or delay deterioration, it is inadvisable.

#### **Agricultural Appropriations**

The Senate, on June 6, passed the agricultural appropriations bill which appropriates \$250,000,000 for the 1952 Agricultural Conservation Program and gives authorization for the 1953 A.C.P. The bill was passed by a vote of 35 to 23, after several amendments proposing cuts in the authorization were defeated. The House of Representatives had previously passed the bill after similar attempts to cut the appropriations were defeated.

#### **Expanded Shale Aggregate**

A SUMMARY of the results of an investigation on "Lite-Rock," an expanded shale aggregate, appeared in the May issue of Highway Research Abstracts. The investigation, conducted by R. D. Ritchie and S. H. Graf, Engineering Experiment Station, Oregon State College, consisted primarily of tests on the expanded shale aggregate in structural concrete. The following conclusions were given.

Unit weight, dry, is from 60-80 lb. per cu. ft. The maximum size and amount of coarse aggregate are critical in mix design. An air-entraining agent or dispersing agent is rec-

ommended but not necessary. The compressive strength ranges from 1200 to 4200 p.s.i., depending on the cement factor and the maximum size aggregate. Less strength is gained beyond the 7-day curing period than with heavier concrete. Resistance to bond and shear is in accord with compressive strength. Absorption is not excessive when considered on a volume basis. Twenty-eight-day shrinkage is less than for gravel concrete. Abrasive resistance is very low. The low modulus of elasticity of this concrete is remarkably well suited to reinforced concrete design.

#### **Places Kiln in Operation**

DRAGON CEMENT Co. recently announced that its 11- x 356-ft, rotary kiln, which has been in process of construction for the past year, has now been placed in operation at the company's Thomaston, Maine, plant. The smaller of two existing kilns was dismantled to make room for the new and larger kiln. The two kilns now in operation have a combined capacity of 900,000 bbl. of cement annually. It is expected that the additional output of cement will greatly relieve the cement shortage which had previously existed in Maine and other New England areas served by the company.

#### Sand Firms Combat Strike

THREE TOPEKA, KAN., sand and concrete companies used an organized labor technique and "struck against a strike." A local truck driver's union had stationed pickets at the plant of Kansas Sand Co. after failure to reach agreement with the company in wage negotiations. Shortly after the pickets were stationed at the Kansas Sand Co. plant, Victory Sand and Stone Co., River Sand Co. and Gerlach Builders Supply Co. discontinued operations at their plants. The union termed it a "lockout" of employes.

#### **Coming Conventions**

September 3-6, 1952-

American Institute of Mining and Metallurgical Engineers, Industrial Minerals Division, Fall Regional Meeting, Chicago, III.

September 15-17, 1952—

National Lime Association, Operating Division, Mountain Lake Hotel, Mountain Lake (Giles Co.), Virginia

October 13-20, 1952-

National Industrial Sand Association, Fall Meeting, Castle Harbour Hotel, Bermuda

#### **Portland Cement Production**

THE PORTLAND CEMENT INDUSTRY produced 19.817,000 bbl. of finished cement in April, 1952, as reported to the Bureau of Mines. This was a decrease of 2 percent compared with the output in April, 1951. Mill shipments totaled 21,764,000 bbl., an increase of 4 percent from the April, 1951, figure, while stocks were 10 percent above the total for the same month in 1951. Clinker production during April, 1952, amounted to 19,-596,000 bbl., a decrease of 4 percent compared with the corresponding month of the previous year. The output of finished cement during April, 1952, came from 154 plants located in 37 states and in Puerto Rico. During the same month of the previous year, 20,184,000 bbl. were produced in 151 plants.

### New Vermiculite Application

Baking a protective interior coating on large industrial vats has been made safe and economical through the use of vermiculite high-temperature cement, according to F. R. Killam, president of Industrial Coatings, Ltd., Vancouver, B.C.

Vermiculite high-temperature cement, a product of Zonolite Co., Chicago, Ill., is blown on the outside of vats treated at the Vancouver plant, where the system was developed. This insulation method is claimed to cut fuel costs and reduce the baking time and, since vermiculite is an incombustible material, its use minimizes fire

hazards at the plant.

A %-in. layer of the vermiculite cement is blown on the outside of the vats and then the first coat of protective phenolic resin is placed on the inside. Raw flame is applied to the interior with a specially-designed propane gas burner and, as the phenolic resin is being baked, the cement dries. A final coat of insulating cement of the same thickness is then applied, followed by a second interior resin coating.

The large vats range in size from 8-10 ft. in dia. and 20-40 ft. in length. Without adequate insulation, the heat radiation from such large metal areas would prevent the building up of prevent heat levels.

proper heat levels.

#### **Gravel Plant**

THE FREDERICKTOWN SAND & GRAVEL Co., Fredericktown, Ohio, has completed construction of its new plant and has started production of concrete and masons sand and washed crushed gravel. The new plant is under the management of Clarence Tugend, formerly superintendent of the Ohio State Highway Department, and Richard Standard, formerly associated with the state highway testing laboratory and Mansfield Asphalt Paving Co.

#### **Monazite Sands**

SEVERAL MINING COMPANIES are dredging sand and gravel in the old gold mines of the West, in search of monazite sands and other rare earth minerals. In Warren Valley, near Boise, Idaho, three dredges are excavating approximately 15,000 cu. yd. of sand and gravel daily. Altogether, Idaho is expected to yield more than 200,000,000 cu. yd. of monazite. The sands are also said to contain about 4-4½ percent thorium, a radioactive and fissionable material which will be used by the Atomic Energy Commission.

Until a few years ago, monazite sands were imported from Brazil and India, but when exports were stopped, for nationalistic reasons, replacement was needed for the 2500-3500 tons

normally imported.

As with all scarce materials or metals, the monazite sand shortage has caused a boom in prices. In 1922 the price was \$180 per ton, dropping to as low as \$60 during World War II. Now, however, sands containing 65 percent rare earth minerals are reported to be worth \$375 per ton. Geologists report that a few of the rare earth minerals are worth up to \$1 per milligram.

#### Receives Loan

PENN-DIXIE CEMENT CORP., New York, N.Y., has received a loan of \$3,500,000 from the New York Trust Co., the Chase National Bank on \$\% - \text{percent} \text{ notes, falling due September 1, 1953, through 1957. The loan will be used to pay off \$1,500,000 in bank notes and for other corporate purposes.

#### **Asbestos Company Formed**

The 4,000,000 authorized shares, \$1 par value, of Lafayette Asbestos Co., Ltd., were recently called in for trading on the listed section of the Montreal (Canada) curb market.

The company purchased the mineral rights together with machinery and equipment from St. Lawrence Asbestos Co., Ltd., whose property is situated in Cranbourne township, Dorchester county, Quebec. The acquired property consists of 1040 acres. The company issued a total of 1,842,222 shares for the property, sold 669,157 shares and has 1,488,621 shares in the treasury. The Sutherland Co., New York, N.Y., has entered into a firm commitment to purchase 1,463,000 shares of the unissued treasury stock for a total of \$1,353,000.

Officers of Lafayette Asbestos Co. are P. Chiarella, Montreal, president; H. Crepeau, Montreal, vice-president; and J. M. Lord, St. Odilon, Que, secretary-treasurer. The directors are C. Martel and P. E. Frechette, Sherbrooke, Que.; G. Hebert, R. Hebert and F. E. Hebert, Worchester, Mass.; and E. W. Paine, Holden, Mass.



Noel J. Redmond (left), Gypsum Association president, congratulates Malcolm Meyer, Certain-teed Products Corp., for safety records established at the Acme, Texas, and Grand Rapids, Mich., plants during 1951

#### **Gypsum Safety Competition**

THE GYPSUM ASSOCIATION reports that the lost-time injury frequency rate in gypsum-producing plants in 1951 dropped to an all-time low of 12.88 per 1,000,000 man-hours worked.

The Acme, Texas, plant of Certain-teed Products Corp., Ardmore, Penn., won top honors in the Class A division, plants working 600,000 or more man-hours. The same company won Class B honors, plants working between 425,000 and 600,000 manhours, at its Grand Rapids, Mich., plant. The Acme plant had an accident frequency rating of 3.23 and the Grand Rapids plant had a zero accident rating.

United States Gypsum Co., Chicago, Ill., also won two safety awards. The company had a zero rating at its Norfolk, Va., plant, winning Class C honors for plants working between 275,000 and 400,000 man-hours. Its Loveland, Ohio, plant had an accident-free rating, winning top honors for plants working less than 275,000 manhours.

The Gypsum Association has sponsored an intensive safety-training program for the last nine years and, during that time, accidents in gypsum-producing plants have been reduced more than 50 percent. There was a 2½ percent decrease from 1950 to 1951. Highlights of the safety program are three motion picture films: "Prescription for Safety," "Pass the Word Around" and "Handle with Care."

#### **Potash Plant**

WESTERN POTASH CORP., Toronto and Calgary, Canada, plans to build a potash plant at Unity, Saskatchewan, within the next two years, as recently announced by J.O.G. Sanderson, president. The plant would mine Canada's only known potash deposits located on 120,000 acres in the Unity area, on which the company holds leases.

#### Plans New Cement Plant

LEHIGH PORTLAND CEMENT Co., Allentown, Penn., recently announced plans to build a cement plant near Monticello, Minn., about 25 miles west of Minneapolis. John S. Young, president, indicated that construction will not begin for another year or two, after the company's new cement plant at Bunnell, Fla., is completed.

at Bunnell, Fla., is completed.

It was stated that although cement raw materials are scarce in Minnesota, the company had found some which are satisfactory. The company had acquired the Monticello site several years ago and also maintains a sales and distribution center in Minneapolis. Savings in transportation costs make a plant in this area desirable.

#### Thermal Expansion

A RECENT REPORT in Highway Research Abstracts describes an investigation made by the Building Research Station, Watford, England, in collaboration with the Institution of Civil Engineers, to obtain information on the thermal expansion of concretes made with various British aggregates and with different cements and conditions of curing. Results of the tests indicated the following.

1. The coefficient of thermal expansion of a concrete depends largely on the type of aggregate from which it is prepared—concretes made with siliceous aggregate have the highest expansion; those with limestone aggregate, the lowest; and those with igneous aggregate have intermediate

expansion.

The thermal expansion of a concrete increases slightly as the coment content is increased.

Age appears to have only a minor effect on the thermal expansion of a concrete.

4. Desiccated and water-saturated concretes have the same coefficient of thermal expansion—lower than that of a partly dried specimen.

#### To Increase Stock

STOCKHOLDERS OF LONE STAR CEMENT CORP., New York, N.Y., voted recently to increase the authorized common stock from 3,000,000 to 4,000,000 shares, \$10 par value. Stockholders also approved a proposal for a restricted stock-option plan for company officers and other key personnel.

#### Pavement Yardage

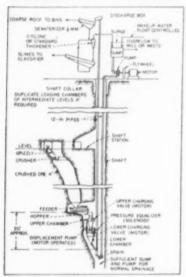
AWARDS OF CONCRETE PAVEMENT for the month of May and for the first five months of 1952 are listed by the Portland Cement Association as follows:

	Sq. yd	awarded
	During May 1952	During first five months 1952
Roads	2,783,222	11,802,874 9,951,590 2,955,100
Totals	6,702,225	24,709,564

# INTS and ILLPS FEOTIT-MAKUNG IDEAS DIVELOPED BY 698

#### **Elevating Rock by Pump**

THE CALUMET AND HECLA CONSOLI-DATED COPPER Co., Shullsburg, Wis., has pioneered the use of a system



Balanced arrangement for closed-circuit water system

whereby 4-in. crushed rock (ore in this case) is pumped vertically some 365 ft. through a 10-in. pipe.

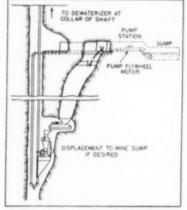
In this system, crushed rock is fed into a hopper mounted over the unit. It is then discharged through a suitable valve into a hopper-shaped chamber. The valve then closes and pressure is equalized through a pressure equalizer. A second and lower charging valve next opens, allowing the rock to settle into the lower chamber which is also hoppered. The lower charging valve then closes and the crushed rock is elevated to the surface in the mine pump's discharge col-



Pump, for pumping 4-in. rock 365 ft., is lowered into shaft at mine

umn. It is stated that this installation is a single pipe system and takes no more power than that required to pump the normal flow of water out of the mine. At 1500 g.p.m. the system has a capacity of 60 t.p.h. and at 2000 g.p.m. a capacity of 120 t.p.h. The company has used this system quite successfully and a patent for the process is now pending.

Where quarries are becoming deeper and deeper, more and more water flowing into the excavation can often be expected. Also, there is a decided



Installation for mine where drainage is ample to lift material hydraulically

trend in quarry operations to do more of the crushing at quarry floor levels. This entails lifting the crushed rock to the screening and washing plant at the rim of the quarry. These hoisting systems can be quite expensive, so possibly some crushed stone producer may find this new development to have possibility.

#### Repairing Final Drive Housing

ON A REPAIR JOB at San Jose, Calif., the use of a new electrode that cuts iron and steel and other metals without the use of oxygen was said to have saved the company \$1305.36 and 12 days downtime.

The repair job involved an Allis-Chalmers HD-5 crawler tractor. A broken capscrew in the grease had caused a series of breaks in the final drive housing. A new housing would have cost \$900, plus 256 man-hours for disassembly and reassembly with the new part. By undertaking the repair by welding with only partial disassembly, total labor on the job involved only 64 man-hours, with the repair being completed in four days, as against the 16 days estimated for putting in a new casting if one could





Top: Partial disassembly of crawler tractor showing breaks in final drive housing. Bottom: Broken pieces pressed back in place with jacks and tack-welded; casting was veed along broken line with cutting electrode

be promptly obtained. The electrode used was an All-State all-purpose cutting electrode, manufactured by All-State Welding Alloys Co., Inc.

The cost of the repair job was listed as follows:

	were seen	46 10 10													
Brazing	rod			* 1						y	× 1	.,		\$	21.4
Cutting	electr	ode	4.4							÷					4.9
Acetyles	ne (on	e tar	nk	)											4.00
Oxygen															4.00
Labor										٠,					146.56
	Total	***							×				. 1	5	180.88
Estimate	ed cost	of n	ew	1	(14)	15	a	ne	ı						
attend	ant la	bor											. 3	12	486.24
Saving															

#### **Communication System**

IMPORTANT SAVINGS in time and effort have been effected at a ready-mixed concrete plant in the Midwest by the installation of a TelAutograph machine. The machine, which is the contact between the aggregate elevators and the order desk at the front of the yard, will electronically reproduce messages written on a roll of paper tape.

Unit No. 1 of the TelAutograph system, installed on the order desk, is connected with unit No. 2, located in the materials elevator. When a trucker comes in with an order for concrete of a particular mix, the dispatcher or desk clerk merely writes out the order, giving name, amount, and percentages of gravel, sand, cement, water and other materials to be used. The message is conveyed to the elevator foreman who is notified by means of an electric whistle which is connected with the second TelAutograph unit and actuated by a whistle on the first unit.

Under normal conditions, the ele-

vator foreman will have the mix ready by the time the truck travels the 450 ft. from the order desk to the semi-circular aggregate elevator at the rear of the yard. Under pressure of heavy construction jobs, etc., the TelAutograph is claimed to have saved as much as 5-10 min. per truck in the loading of transit mixers and other vehicles. The order clerk and the elevator operators are said to be able to transmit messages back and forth even more rapidly than by means of an inter-communication system, with the additional advantage of having a graphic record of orders and developments which may be filed for later reference.

#### Water Cooling Tower

AT AN OPERATION in the South, two severe conditions prevail—hot weather and dust. Plant operations involve calcination and fine grinding under very dusty conditions. Buda diesels supply the primary power. To insure an adequate supply of cold water for the diesel's circulatory system, a cooling tower has been placed in the engine-radiator flow system. The tow-



Cooling tower supplies cold water for diesel's circulatory system

er is constructed of vitrified clay tile, with ample air spaces provided to aid in evaporation and cooling. A coil of pipe within carries the engine cooling water, and overhead sprays do the cooling. Intake air for the engines can also be taken from the tower.

#### Bin Drainage

The illustration shows one of two 200-ton capacity parabolic steel bins that are used for storage of a washed crushed stone that is in the minus ¼-range. A belt conveyor parallels the long axis of the bin and there are ten slide gates available for reclaiming to this loading belt. Near each gate is a drainage port and water from the bin is led to a sump by the series of rectangular drainage chutes. This makes a serviceable method of getting aggregates down to a lowwater content and keeping the spillage from underfoot.



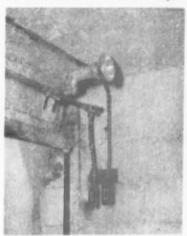
Truck dumps load into pan and crane transfers material to gondola

### Loading Aggregates to Gondolas

A SOUTHERN SAND and gravel operator transports his material by truck to a railroad several miles distant where two cranes are used in transferring the material from the trucks to the gondolas. Attached to each crane is an old bob-tail truck body which lies flat on the ground and serves as a receiving pan. Upon arrival at the unloading point, the truck backs into the bob-tail and the crane scoops out two or three bucket loads of gravel and unloads it into the gondola. The remainder of the load is dumped into the pan from the rear dumper used for hauling. The crane then transfers the remainder of the material from the pan to the gondola. The pan is pulled along by the crane. This method of loading the gondola keeps the yard clean and prevents loss of material.

#### Reducing Corrosion in Kilns

THE HOT, MOISTURE-LADEN atmosphere of a concrete block curing room can be counted on to reduce unpro-



Old electric conduit at right was disabled by corrosion in kiln; new conduit at left was equipped with explosion-proof switch and painted with rust preventative

tected steel to a worthless mess in but a short time. One producer, whose lighting system in the kilns was disabled by corrosion of the conduit, solved this problem by installing as little conduit as possible. Instead of running the line lengthwise down the kiln and breaking into this for overhead lights, he placed the electric line across the kiln at each end. The most important precaution against corrosion was the use of an enclosed, explosion-proof switch, and the painting of the conduit with a rust-preventive paint. This producer used an orange Rust-Oleum paint.



Belt conveyor parallels axis of 200-ton capacity storage bin

## MEIN

## Machinery



#### **Scalping Tanks**

EAGLE IRON WORKS, 137 Holcomb Ave., Des Moines, Iowa, has announced recent developments in its water



Water scalping tank with automatic bleeder valves

scalping tanks, among which are automatic bleeder valves and rotating spouts on the discharge openings of the scalping tanks.

To eliminate the need for continual manual operation of adjustable bleeder gates or valves, the improved valve is self-operating. It opens when sufficient sand has settled within the tank. As the level of sand in the tank drops, the valve closes partially, allowing the sand to build up. The weight of the sand which settles on an actuator plate counterbalances the force of an adjustable spring, thus opening the valve.

The rotating spouts on the discharge openings are used with a divided collecting-blending flume below the tank so that part of the product can be diverted to a coarse sand washer and part to a fine sand washer as desired.

#### Rear-Dump Wagon

LAPLANT-CHOATE MANUFACTURING Co., INc., Cedar Rapids, Iowa, has added a hydraulically operated reardump wagon, the TR200 Motor Wagon, to its line of earthmoving equipment. The two-wheeled, rubber-tired tractor that powers the wagon is available with a choice of diesel en-



Hydraulically operated rear-dump wagon gines, either a 165-hp. Cummins or

a 176-hp. Buda.

The unit has four wheel air brakes, and the body tilting angle is 70 deg. Top speed is 22 m.p.h. at a governed engine speed of 1800 r.p.m. The wagon unit can be interchanged with a scraper.



Programming control for burner installations

#### **Burner Control**

COMBUSTION CONTROL CORP., 77 Broadway, Cambridge 42, Mass., has announced its Fireye programming control Type 26RJ8, designed to provide automatic starting and programming control for commercial and industrial gas, oil, and combination gasoil burner equipment. It is used with the Firetron scanner Type 48PT1 to protect burner installations from the hazard of flame failure. The control automatically starts a burner in operation and programs a sequence of pre-purge, ignition-on, fuel valve delay, post ignition timing, and postpurge. Its response to flame failure results in complete fuel cut-off in 2 to 4 sec.; a built-in time delay prevents false shutdown from transient effects such as smoky streaks in the flame or irregular draft conditions.

#### Clamshell Cutter

BLAW-KNOX Co., Bucket Dept., Farmers Bank Bldg., Pittsburgh 22, Penn., has developed a reversible and replaceable cutter for clamshell buckets to replace the old type, one



Reversible and replaceable cutter for clam-

piece tooth. The tooth consists of a base which is permanently attached to the scoop, or lip, in the usual manner and a reversible and renewable tip which fits into a slot and wedges itself into the base.

#### Safety Goggle

WILLSON PRODUCTS, INC., Reading, Penn., has developed an all-plastic safety goggle, the No. 91 Monogoggle, that has a flexible, transparent frame molded of Vinylite. The lens is of 0.06-in. acetate and is replaceable.

#### Steel Sheave Block

SAUERMAN BROS., INC., 530 S. Clinton St., Chicago 7, Ill., has enlarged its line of Durolite tempered steel



Sheave black designed for slushing duty

sheave blocks by adding a block designed primarily for slushing, mucking and wrecking duty. Sheaves and frame are of differential heat treated alloy steel. New features include a wider, flatter sheave groove to permit use of larger cable than in standard block of the same diameter, extra wide throat opening to pass knotted cable, and light weight.

#### **Power Operated Valves**

LEDEEN MANUFACTURING Co., 1600 S. San Pedro St., Los Angeles 15, Calif., has announced that the POV power operated valve is available in six sizes, suitable for air, oil and water operation with option of finger, cam, toe or solenoid pilot controls. The valves are designed to serve a variety of purposes where hand or foot operated valves cannot be used, such as remote control, automatic operation, reciprocating service, or safety controls.

This power operated valve is essentially a standard four-way valve, but the rotation of the disc is accomplished by means of a piston moved by the operating fluid pressure of the main line, and controlled by small pilot valves. Applying pressure through the pilot on one end of the piston forces it to move ahead and rotates the valve disc to forward position. Applying pressure on the opposite end moves the piston back and rotates the disc to reverse position.

#### - NEW MACHINERY -

#### Heavy-Duty Oil

SHELL OIL Co., 50 W. 50th St., New York, N.Y., has placed on the market Shell Rimula oil, designed for automotive-type diesel engines as well as certain gasoline engines operating in some industrial stop-and-go, low temperature service. The oil was developed to minimize problems of engine wear and fouling caused by operating conditions that are aggravated by low loads, high sulfur fuels and low temperature operations.

#### Single Phase Variable Speed Motor

U.S. ELECTRICAL MOTORS INC., Box 2058, Los Angeles 54, Calif., has announced a new development in sin-



Single phase variable speed motor

gle phase variable speed motors in fractional horsepower. Designated as Type VA-C Varidrive, the motor is made in ¼, ½, and ¾ hp. and permits the use of 110 or 220 volts. It provides speeds in a 10:1 ratio with the range from 4 to 10,000 r.p.m. The motor's speed can be changed without stopping by turning a control dial.

#### **Priming Inductor for Pumps**

Nagle Pumps, Inc., 1249 Center Ave., Chicago Heights, Ill., has designed a priming inductor for priming of pumping systems where the pump is situated above the water level. Basically, it is a water operated jet, its purpose being to fill the entrance pipe and pump with liquid so as to initiate pumping. These units are available for use with Nagle centrifugal pumps which are not self-priming and other makes of horizontal shaft pumps which are not self-priming. They are made in 13 sizes to fit entrance pipes from 1½ to 18 in.

#### Dump Truck Bodies and Hoists

St. Paul Hydraulic Hoist, Minneapolis, Minn., has announced a new line of hydraulic dump truck body hoists and bodies. The hoist is available in 14 models, from 6 to 25 ton capacity. The body hoists feature low mounting height, advanced lifting point, low operating oil pressures, "Uniflex" subframe, and friction-free roller bearing drive mechanism. A unique stress-eliminating design fea-

ture of the hoists is said to almost entirely absorb dumping shocks and permit use of a flexible subframe



Hydraulic dump truck body hoist

which ends tendency of rigid hoists to crack or bend when flexed. Contractor's type bodies were released with the hoists as matching units.

#### **Tractor Tires**

FRANK G. HOUGH Co., Libertyville, Ill., has announced as optional equipment for its Payloader tractor shovels a 13.00 x 24, 16-ply rock-type tire for mining and quarrying service. The tire fits the standard 24-in. semi-drop center rim.



Loader equipped with rock-type tire that fits

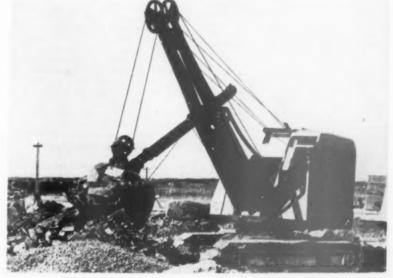
#### Four-Point Drill

Rock Bit Sales & Service Co., 2514 East Cumberland St., Philadelphia 25, Penn., has announced a fourpoint, carbide tipped, drill steel made in 1½ to 2¼ in. gauge sizes and in lengths up to 12 ft., with shanks to fit any hammer. In the Intra-Set steel, the alloy drill steel and carbide bit are of one piece construction.

#### **Excavator and Crane**

FINDLAY DIV., Gar Wood Industries, Inc., Findlay, Ohio, has announced the Gar Wood 75 standard and heavyduty ¾-cu. yd. excavator and 20-ton truck crane, featuring power actuated drum clutches, direct right angle drive, optional hydraulic coupling and the new Foundation Borer attachment. The unit is convertible in the field to shovel, crane, dragline,

clamshell, trench hoe or pile driver. The Foundation Borer attachment combines belling and boring into one operation. Other features include self-cleaning, nonclogging crawler tracks, worm driven boom hoist with safety lock, nonswaying, hooked conical rollers running in a double-flanged path, and vacuum controls for steering and dipper trip. The unit is also offered as a 20-ton truck crane.



Direct right angle drive used in 3s-cu. yd. excavator



Final screening plant houses two wet, double-deck vibrating screens operating in parallel. Only one screen is used at a time. Most of the material is loaded directly to cars as little bin storage has been provided



Oversize material goes to this primary crusher, with a cone crusher serving as the secondary unit. The cone unit can also serve as the primary crusher if desired



A 1060-ft. belt conveyor delivers material from the dewatering bucket elevator assembly to the final washing and screening plant in the background

# COMBINING ECONOMICS OF DREDGE AND BELT CONVEYOR TRANSPORTATION

Fordyce Gravel Co. uses dewatering elevator in transferring material from pump sump to field belt conveyor. Novel floating conveyor simplifies disposal of overburden

By WALTER B. LENHART

FORDYCE GRAVEL Co., with headquarters in San Antonio, Texas, has three plants near Victoria, one at Mathis and two in the lower Rio Grande Valley, all in Texas. The latter two operations are at Sullivan City and Rio Grande City. C. A. Chipley is vice-president and general manager and nominal operating head of the company. Mr. Chipley is a director of the National Sand and Gravel Association.

The three Victoria, Texas, operations are all within sight of each other. One is a road gravel plant. The other two plants, the Saxet and Victoria operations, produce washed sand and gravel, and all involve use of gravel dredge pumping to a high degree. The Saxet operation was described in the August, 1943, issue of ROCK PRODUCTS and was of primary interest at that time because stripping as well as the sand and gravel were handled by dredge pumping.

were handled by dredge pumping.

Some observations made by Mr. Chipley comparing the cost of pumping gravel with the cost of transporting on belt conveyors may hold much interest for other producers. Due to the gradually increasing cost of steel wearing parts and the increased cost of steel pipe, coupled with some deterioration in the quality of the latter, the time has come when it is more economical to transport sand and gravel on rubber belt than to pump it, in this operator's opinion.

The gravel deposits in the Victoria area are by no means unlimited in size, and the years of remaining gravel are measureable. Possibly two decades or less from now, gravel in

Victoria will be a very scarce commodity. An example of the heavy demands made upon this deposit can be given. The acceptable gravel in the lower Rio Grande Valley is mostly all coming from the railhead near Rio Grande City. That little community is the upstream end of the lower Rio Grande Valley. At one time some gravel was produced further downstream-and some sand and gravel is still being produced in this upper end of the Valley. But the time is not far distant when gravel will have to be trucked from areas still further up the river and to the railroad at Rio Grande City-or it will have to be shipped in from the Victoria deposits. Depletion is obviously important to these producers and to all throughout Texas.

The Victoria gravel is a bedded deposit ranging from 10 to 15 ft. thick and overlaid with 15 ft. of gumbo-like clay soil—sticky and hard to handle when wet. The beds of gravel now being processed at the Victoria plant of Fordyce Gravel Co. contain about 60 percent gravel, all relatively small in size. Large areas must be excavated yearly, and past operations have depleted the more easily handled deposits so that as each day goes by pumping to the processing plants becomes more distant and more costly.

#### **Belt Conveyor System**

Fordyce Gravel Co. early this year placed in operation at Victoria a combination belt conveyor-pumping transportation system that appears to solve many of the problems. The



Dragline loading overburden to the floating disposal unit which dumps waste material into worked-over area of pit

system involves pumping a relatively short distance from a 12-in. Morris dredge pump to a strategically located dewatering bucket elevator assembly, the excess water returning to a pond formed from a worked out area, and discharging this dewatering elevator to a 1060-ft. center-to-center belt conveyor that serves a surge pile near the final washing and screening plant.

The belt is 30 in. wide and is powered by a 125-hp. motor. This motor is capable of handling an additional 500-600 ft. of conveyor and will at some time in the future drive a belt some 1600 ft. long when the dredging operations become more distant from the washing plant. Looped 1/8-in. steel rods on about 40 ft. centers act as wind guards over the belt. As a further protection against wind damage, is left loaded when not in use. The longitudinal steel rail sections are bolted end to end. The conveyor was a part of the 7-mile long belt conveyor used at Bull Shoals dam (described in the September, 1951, issue of Rock Products, page 78).

#### **Dewatering Method**

The dewatering elevator operates in a concrete sump 10 ft. wide x 40 ft. long and 9 ft. deep. The toe of the elevator is near the center of the pit, The 12-in. pipeline unloads near the front end of the bucket line. Considerable turbulence is present and one might suspect that some of the finer (minus 100-mesh) sand would be lost. This possibility was considered in the design by installing a steel settling box that is a part of the overflow weir of the main concrete pit. At first the outlet of the concrete pit was behind the bucket line. Later the outlet was moved to a point almost alongside the buckets. At the first location some fine sand was lost. but moving the outlet to the new location saved so much fine sand that the steel sand boxes provided in the original design have not had to be used.

The buckets on the dewatering elevator are 28 in. long. The front section of the bucket is made of Arin. perforated steel plate so that excess water in the sand and gravel can drain back to the pit. There is a total of 52 buckets on the line, which

turns at the rate of 5 r.p.m. It is driven by a 25-hp. motor through a gear reduction unit. The buckets dump to a steel hopper serving the long belt conveyor. The 12-in. pump serving this unit is driven by a 400-hp. motor. The lower bearings of the bucket elevator are water-sealed and a 2-in. pump supplies clear water from a nearby pit at a sufficiently high pressure to keep sand from entering the bearings.

Vertical supports for the belt conveyor are made from used 12-in. diameter dredge pipe, and the cross supports as well as the longitudinal elements were made from used 40-lb. steel rails salvaged from some of the company's older operations. A walkway will be provided alongside the belt. Self-aligning idlers are used wherever required.

The take-up assembly of the long belt is a little out of the ordinary for it is built entirely separate from the rest of the conveyor system. It is the long take-up type and the supports consist of used steel dredge pipe. The assembly has been erected from necessity on the edge of a small bluff, and as floods are fairly frequent it was deemed advisable to build the take-up tower separate from the rest of the system. Thus if a flood did undermine the take-up tower, the collapse would not pull down the rest of the system.

At one time a dewatering elevator was installed quite close to the final working plant. It unloaded to a short boom 30-in. belt conveyor serving a surge pile. The new belt unloads to this short belt. Reclaiming from the surge pile is by belt conveyor that operates in a 60-ft. tunnel. Gravity-type gates are used.

#### Screening

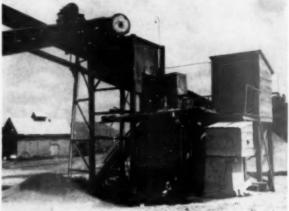
The sand and gravel produced is of high quality and is quite free from clay inclusions. Screening operations are simple: two wet, double-deck vibrating screens operating in parallel. When larger gravel is needed, the 5- x 12-ft. Tyler screen is used; for smaller sizes a 4- x 12-ft. Simplicity screen is used. Only one is used at a time, and at time of inspection the plant was producing a minus 1½-in. material and loading it direct to



Above: Dumping strippings into the "stripping conveyor" hopper. The feeder under the hopper resembles a conventional apron feeder. Below: The dewatering elevator operates in a concrete sump and unloads to a steel rock box serving the belt conveyor.







Left: The long belt conveyor delivers material to a short stacker that serves a surge pile (center). Reclaiming from the surge pile is by belt conveyor that operates in a 60-ft. tunnel. Right: A cone crusher is used as the secondary crusher, although it can be run as the primary unit if desired

cars, for no sizeable bin storage space has been provided.

Oversize gravel can be chuted to a No. 79 Kue-Ken Simplex crusher. A 3-ft. Symons cone crusher is the secondary unit, though this can be run as the primary if desired. One grade of sand is produced in a settling area near the plant. A Koehring crane with 1½-cu. yd. Page drag bucket handles the sand to storage or to car loading. A truck loading hopper of large capacity has been built using still more of the 12-in. dia. used dredge pipe. The structure is built crib-like so that trucks can back into the tunnel for loading.

#### Floating Stripping Unit

Stripping of the gravel deposit is accomplished in two ways. When the water table is low, a 3-cu. yd. P&H dragline using a Hendrix bucket loads to trucks. When the water table is high a floating "stripping conveyor" is used. This is a novel piece of equipment built under the direction of C. F. Brugman, general superintendent of the three Victoria plants. A 42-in. flat-running belt conveyor 210 ft. long, center to center, has been assembled on a total of ten steel pontoons, each of which is 4 x 8 x 16 ft. Four pontoons are under the loading hopper, two are at the tail end and the others are spaced along the length of the conveyor.

The steel receiving hopper has a feeder under it that somewhat resembles a conventional apron feeder, except in this case steel cross members act as drags to feed the sticky overburden continuously to the belt conveyor. When the stripping conveyor is in use it is floated near the bank so the clamshell can strip and dump to the receiving hopper. The conveyor is long enough to prevent debris dumped back into the pond from being picked up again and recirculated. The dredge operates without a cutter, i.e., open suction. Lowering of the



Used 12-in. dredge pipe and used 40-lb. rails support the long field conveyor

water table was a contributing factor in the decision to discontinue stripping by dredge pumps.

Fordyce Gravel Co. has a district office at the plant. C. F. Brugman is general superintendent of all three operations at Victoria. Bud Bogt is foreman of the Victoria plant.

#### Recovering Manganese From Slag

A NEW METHOD of recovering manganese from slag has been developed by the steel industry, in cooperation with the U.S. Bureau of Mines. The new process, which gives a synthetic manganese ore containing 55-63 percent manganese, is expected to reduce the dependence of the American steel industry on foreign sources of this critically short alloying material.

An experimental blast furnace was designed to process the slag and it was reported that the first successful taps of the pilot furnace produced metal containing 21-24 percent man-

ganese and small amounts of silicon and phosphorus. The rest was iron which can be processed to make highgrade steel. Sorting of the mixture was done in a "Bessemer-like converter" which produces a high manganese slag containing 55-63 percent manganese, the phosphorus remaining with the iron. A converter with four times the capacity of the original one is now being constructed to bring the manganese recovery process closer to a full-scale level which will give a truer indication of costs. It is expected that the salvaged pig iron will more than offset the cost of producing the manganese. One problem yet to be solved is reducing the phosphorus content of the recovered iron.

#### **Closes Gravel Plant**

RAY & Son, Louisiana, Mo., has discontinued operation of its sand and gravel plant, as recently announced by Earl Ray, Sr., president of the company.

During the 27 years' operation of the plant, sand and gravel were obtained from deposits along Niox creek, extending a distance of approximately five miles east and west of the plant. The gravel deposits available for transportation to the plant on an economic basis have now been depleted.

The company will continue its general contracting business, concentrating on highway construction. Plans are now in process for converting the gravel operation into a crushed stone plant which is expected to be in operation by the spring of 1953.

#### **Leases Phosphate Lands**

MONTANA PHOSPHATE PRODUCTS Co., Garrison, Mont., has obtained a lease on 520 acres of government-owned land near Gold Creek, Mont. The company also holds rights to lands adjacent to the government-owned property.

## "PROSPECTIVE" CHEMISTRY OF CEMENT AND CONCRETE

Part I. Some of the chemical elements involved

LITTLE REAL PROGRESS will be or can be made in understanding cement research data until those sufficiently interested are able to apply modern concepts of structural and colloid chemistry. The old ideas and theories of analytical inorganic chemistry, which most of us have been more or less familiar with, may be enough to determine or understand how the percentages of the various oxides in portland cement clinker are calculated, but this is only a small part of the answer to the peculiarities of the cements. We have got to know how these oxides, if they really exist as individual oxides in clinker, are put together structurally. Probably that has rightly been decided upon as the first step in finding out what happens to this structure when it is hydrated. However, there is likely to be quite a long time lapse before much specific data on portland cement clinker are assembled and interpreted. In the meantime, many data are being developed about the struc-

tures of similar minerals.

The Portland Cement Association is probably the only institution in country engaged in this kind of fundamental research on the structural chemistry of portland cement clinker, using all available scientific facilities for such research, including X-ray and the electron microscope. One difficulty is, and always will be, that we are thus dealing with such minute samples of clinker at a time that an infinite number of samples may have to be examined before any satisfactory deductions are possible as to what the average structure of commercial clinker may be. Obviously, clinker is not and cannot be a uniform or homogeneous material from a strictly chemical viewpoint. There are bound to be too many variables in its manufacture-and perfect crystals of any mineral are rare, even in nature,

#### **Broader Understanding**

From our own observation, it seems doubtful if the research work underway, and in fact much that has already been done, can be appreciated and understood by many laymen who

#### By NATHAN C. ROCKWOOD

sincerely want to follow progress, until someone supplies the ground work for understanding of fundamentals in layman's language. We had hoped to find such a writer, but people who are experts in their science are seldom willing to "write down" to the level of the layman. Hence, what you are about to witness here is a layman attempting to use the recorded knowledge of experts for the benefit of other laymen. The writer does indeed have the advantage of possessing numerous up-to-date textbooks, and of having enough time at his disposal to become fairly familiar with them, an opportunity which the majority of his readers probably do not have. Moreover, he will endeavor to protect them from too radical views by consultation or checking with experts on occasion.

#### Some of the Elements

We are going to lead off this series with a brief description of the structures of the chemical elements themselves, that is, those particular elements with which we are chiefly concerned-hydrogen, oxygen, calcium, silicon, magnesium, aluminum, iron, sodium and potassium. In the case of cement and concrete it is generally assumed that we are dealing with the oxides and hydroxides of these mineral elements; and even in the case of water, which is most important to our study, it is the oxide or hydroxide of hydrogen, according to whether it is considered H<sub>2</sub>O or HOH. Oxygen is by far the most common element in nature, and it is, from its part in numerous combinations, the most important element in rocks and minerals. Hence, some understanding of the elemental structural chemistry of the oxides and hydroxides, so far as it is known to date, is of much importance to interpretation of experimental data on cement, concrete and aggregates.

There are in all 92 chemically classified natural elements, which used

to be regarded as the primary bases of all known materials, and the smallest conceivable particle of these primary elements is an atom. These elements were divided into relationships or periods and groups, and certain similarities and progressive differences were observed, but it is only within the last 25 or 30 years that all the reasons for these periodic changes came to be known. Then it was discovered that the atoms themselves are not integral bits of different primary matter but are composed of still smaller particles of common primal matter or energy, arranged differently in the various atoms in a fairly simple order or progression from the lightest and smallest of all atoms, hydrogen, to the largest and heaviest, uranium.

Briefly, each atom of an element is now represented as composed of a central nucleus, about which in more or less circular rings or orbits are arranged the tinest particles of matter or energy known, which are electrons and carry negative charges of electricity. The mass or weight of the atom is almost wholly in the central nucleus, which consists essentially of protons, which carry a charge of positive electricity, or attractive force, and neutrons, which are neutral, or carry no charge of any kind. That is not the whole story, but it is enough to understand what follows. It is the positive charge at the center that holds the electrons in their orbits, just as the sun holds the planets in their orbits.

The manner in which the elements we have mentioned differ from one another in their structural makeups is illustrated in Fig. I. It will be noted too that there are some similarities, particularly between silicon and aluminum, which differ by only one electron in the outer shell. The negatively charged electrons are shown spaced in concentric circles around the positively charged central nucleus. In the free state of the atom

these electrons revolve or vibrate around the nucleus, not in planes but in spherical shells. The number and designations of these electron shells are illustrated in Fig. 2. Actually, it is not quite so simple as illustrated because some of the electrons in the shells beyond the K shell are at different distances from the central nucleus, and the L shell is subdivided into s and p sub-shells, and the M shell and those beyond into three and sometimes four sub-shells. The only elements we are concerned with here where these sub-shells complicate matters are aluminum and iron, which have more than one valence or combining power with other elements.

The elements are numbered from 1 to 92, and the number has much significance since it tells the number of electrons in the atom of that element. Thus hydrogen is element No. 1 and has one electron. Helium is element No. 2 and has two electrons. Both of these electrons are in the innermost or K shell. Two electrons in the K shell are all that the atom of any element ever contains in that innermost shell. When this shell is filled with its two electrons, others start to build up until the next outer shell or the L shell is filled. Thus element No. 3 is lithium, which has the two electrons in the K shell and the additional one in the L shell. As the numbers of the elements advance by the addition of one new electron in each case through carbon, which is No. 6, and has the two electrons in the K shell and four electrons in the L shell or six electrons in all, through oxygen, No. 8, which similarly has eight electrons in all (see Fig. 1) to neon which is No. 10 and has eight

electrons in the L shell and ten in all. Eight electrons is all that L shell ever holds, so that from there on the electrons must be added to another outer shell, or the M shell. When an electron shell has its complete quota and none outside this shell, it becomes a practically inert element—an inert gas in most cases.

The eight elements beyond neon, No. 11 to 18 inclusive, with both the K and L shells filled, are said to have a neon core. Thus sodium, No. 11, has the ten electrons as in neon, with one new electron added in the M shell (see Fig. 2). This period contains the elements magnesium, No. 12, aluminum, No. 13, and silicon, No. 14 (see Fig. 1), having respectively two, three and four electrons in the M shell. This period ends with argon, No. 18, which has eight electrons in the M shell, and it is an inert gas. However, the addition of electrons to the M shell does not always end with eight, but keeps on building up in some instances to eight more or 16. This period is then described as having an argon core. In this period, one of the so-called long periods, are ten elements including potassium, No. 19, calcium, No. 20, and iron, No. 26. These elements depart from the general rule, in that they start to build up the N shell before the M shell is completed to the possible 18 electrons that it can and does hold in the heavier metals beginning with copper, No. 29, which has two electrons in K, eight in L, 18 in M and one in N shells, respectively.

#### Sizes of Atoms

We should not leave this subject of the structure of atoms without some conception of the infinitely small particles we are dealing with. The size of an electron is small beyond any possible conception, its mass or weight being calculated as  $9.11\times10^{-3}$  gram, or expressed as a fraction, 9.11 over 1 followed by 28 ciphers. Or, it is  $\frac{1}{10.50}$  of the mass of a hydrogen atom.

The sizes of the atoms in minute fractions of grams (or mass) can be determined by ordinary chemical methods and these atomic weights are always given in any table of the elements. We are not concerned with these here but with the space dimensions, which are determined from X-ray measurements, as "atomic radii." This is not a constant value even for any one element-atom, since it varies somewhat in different combinations of the element, the atoms (or ions) being closer together in some than in others. Hence, the figures for atom diameters given in Fig. 1 are very approximate and are shown here only to emphasize that these elements do have different sizes. This is important because, as will be discussed later, certain element atoms or ions cannot enter certain groupings because they are too large to fit into the spaces between atoms that are available in such a group or pattern or lattice framework.

The difference between an atom and the ion of the same atom is sim-

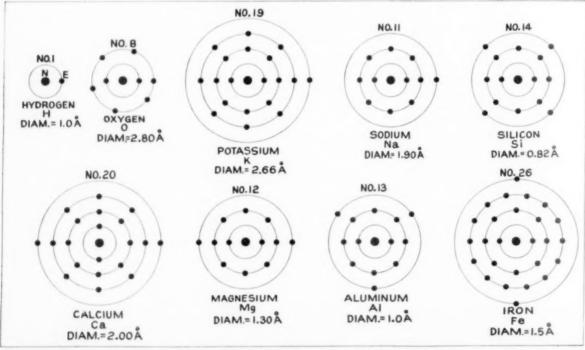


Fig. 1: Electron configuration and atomic diameters of some elements

ply that the atom has lost or gained an electron or two in its reaction with an adjoining atom. When an atom loses an electron it is obvious that the positive electrical charge on the central nucleus is greater than required to hold the remaining electrons in their orbits. Hence this atom becomes a positively charged ion. If it loses one electron it has an excess of positive charge of one, or it has a positive valence of one. Similarly, an atom that takes on an extra electron has an excess of negative charge and its valence is determined by the number of electrons it can take on. It becomes a negatively charged ion of the atom. Thus the difference between the size of an atom and the ion of the same atom is not very great, or atomic radii and ionic radii are pretty much the same.

One may wonder, from the way in which atoms are built up—by having a difference of only one electron between the two adjoining atoms in the same period, why the removal or addition of an electron or two does not change the atom from that of one element to that of another. The answer, of course, is that we have not changed the nucleus of the atom, and the retention of the same nucleus is more important to the character of the atom than the gain or loss of electrons. When part of the protons in a nucleus are removed, as in the

Q P O N M L (K K) L M N O P Q

Fig. 2: K-1 or 2 electrons
L-1 to 2x2² (or 8) electrons
M-1 to 2x3² (or 18) electrons
N-1 to 2x4² (or 32) electrons
O-1 to 18 electrons
P-1 to 12 electrons

Q-1 to 2 electrons

"fission" of the heavier elements (like uranium), and the nucleus charge is no longer powerful enough to retain all the electrons in their orbits, we have an atomic explosion, and lowergrade elements replace the one disintegrated. But that can only happen with elements near the top numbers which have already the largest and strongest proton cores that are pos-

sible-they just can't take on and hold any more electrons.

#### Comparison of Units

The size of atoms, and the distance between them in crystal structures, which can be measured by X-ray, are usually given in Angstrom units-A for short. Now the smallest unit we have much comprehension of is a micron, since the smallest particles of cement clinker are usually from 1 to 5 microns (µ) in diameter. One micron (1µ) equals 1000 millimicrons, or mu for short, and the limit of the most powerful optical microscope is a particle 100 mu in diameter, which is 0.14. An Angstrom unit (Å) is 0.1 of an mμ or 0.0001 of a μ. And, lest we forget, a µ is 0.001 of a millimeter (mm.), and one millimeter is about as small a dimension as the unaided human eye can detect. In other words there are 107 Å in 1 mm., or 10,000,000, or an A unit is 10,000,000 th (0.000,000,1) of a millimeter. Dimensions so small do not mean much to a layman, but they are very important in describing the structure of atoms and chemical combinations, particularly crystal lattices, where such dimensions can be determined by the application of X-ray methods.

by the application of X-ray methods.

In another of this series we shall describe how atoms are bonded or joined together.

#### New U.S. Mica Program

The federal government recently announced plans for setting up two mica purchasing programs, known as "A" and "B" programs. Program A covers the purchase by the government of processed block and film mica, while Program B is for the purchase of hand-cobbed mica.

Block mica was defined as processed muscovite ruby block mica which conforms with the requirements set forth in the regulations covering the new program. Film mica means processed muscovite ruby film mica which conforms with the requirements. Under Program A, the qualities of the block and film mica which will be accepted are "good stained and better, stained and heavy stained." Each lot of block or film mica must contain not less than 20 percent good stained or better quality and must also be full-trimmed.

Hand-cobbed mica was described as run-of-the-mine muscovite ruby crystal which is free of dirt, rock and mine-run scrap and which conforms with the requirements under Program B. It must yield 4½ percent block or film mica, grade six or larger and heavy stained or better quality, of which at least 18 percent must be good stained or better quality, and at least 27 percent must be stained or better quality.

Mica will be purchased by a government specialist on the basis of visual inspection, although the government is reserving the right to utilize electrical inspection as the basis for acceptance.

A mica purchasing depot is to be set up in Custer, S.D. All producers desiring to take part in the new program must notify the regional director, General Services Administration, 1800 Federal Office Building, 911 Walnut St., Kansas City 6, Mo. The government will then send the producer a certificate of participation. Producers do not have to have their mica mines in operation to make the request for participation. The certificate is a binding agreement that the government will purchase all ruby mica that meets the standards for as long as the purchasing program lasts. The certificate, however, does not bind the producer to sell to the government, but does bind the producer to accept the terms cited in the regulations if he does sell to the government. Purchasing depots will also be established in North Carolina and New Hampshire.

Both Programs A and B will terminate on June 30, 1955, or when the total mica delivered to the government reaches 25,000 short tons, whichever occurs first. Regulations covering the mica purchasing program are available at the Custer, S.D., Chamber of Commerce.

In addition to mica, the government announced it would also purchase beryl and columbite-tantalite, regardless of size. It was pointed out that a large amount of valuable beryl crystals is being wasted as a result of hand sorting. It was announced that research is now being carried out to recover small crystals by the flotation process which could be the answer to increasing the tonnage of beryl production.

#### Expanded Stale

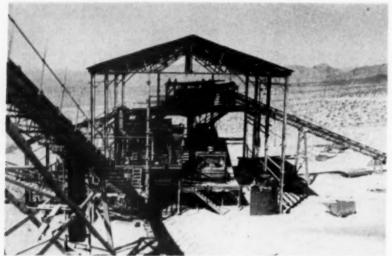
SUNNYHILL AGGREGATES CORP., New Lexington, Ohio, introduced "Lite-Stone," its new expanded shale aggregate, at a recent monthly meeting of the Builders Exchange of Columbus (Ohio).

#### **Hydrated Limes**

THE NATIONAL BUREAU OF STANDARDS has announced the publication of Building Materials and Structures Report 127, on "Effect of Aging on the Soundness of Regularly Hydrated Dolomitic Lime Putties," by Lansing S. Wells, Walter F. Clarke and Ernest M. Levin.

The report is based on the results of an N.B.S. investigation to determine whether potentially unsound regularly hydrated dolomitic lime can be rendered sound by soaking as a putty for a reasonable length of time. Copies of the report may be obtained from the Government Printing Office, Washington 25, D.C., for \$.15 per copy.

### Beneficiation



General view of heavy-media separation plant at the Gabbs, Nev., operation of Basic Refractories, Inc.

Basic Refractories, Inc., uses sink-float process at Gabbs, Nev., operation for processing mine-run ore, as well as to recover material from low-grade rejects from older operation

By WALTER B. LENHART

## HEAVY-MEDIA SEPARATION USED IN PROCESSING REFRACTORY MATERIALS

THE DESERT COMMUNITY of Gabbs, Nev., sprang into national prominence during World War II, for raw materials from this area were used throughout the nation, both as a basic refractory for the steel industry and for reduction to metallic magnesium. Magnesite was calcined to magnesium oxide at Gabbs and shipped to Las Vegas, Nev., where this was reduced to metallic magnesium. However, before World War II Gabbs was the source of brucite, a natural mag-nesium hydroxide, and this was one of the few places in the world where that rock occurred in quantity and of sufficient purity to be of commercial value.

The town of Gabbs is located south of Reno, Nev., about halfway between that city and Tonopah, Nev. The Southern Pacific railroad that connects Tonopah with Reno (via Hazen, Nev.) passes within 30 miles of Gabbs, so all magnesium rock is truckhauled to the railhead at Luning, Nev.

World War II operations at Gabbs were quite extensive and included a large flotation and calcining plant. Behind the plant and at slightly higher elevation are the numerous open pits from which brucite and magnesite are still being recovered. The largest operation there is the one controlled by Basic Refractories, Inc., Cleveland, Ohio. At the time of in-

spection the operation boasted the largest rotary kiln in the world used for dead burning magnesite. It is a Traylor kiln and is 390 ft. long.

#### **Heavy-Media Separation Used**

In the older quarry operations brucite was in part hand sorted and in part selectively mined and some 300,-000 tons of low-grade ore and rejects

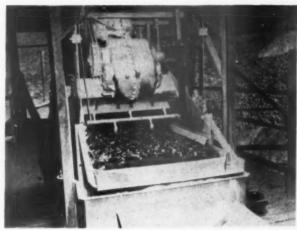


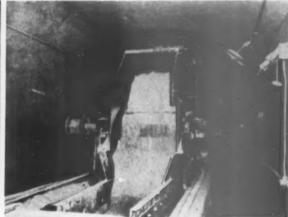
The 14-ft. cone can be dumped through the lubricated plug valve at its apex

had accumulated. In June, 1951, a new heavy-media separation plant was placed in operation to make additional recoveries of brucite from these and to treat mine-run ore materials. The plant uses a 14-ft dia. cone as the separatory vessel; it was designed and built by Western-Knapp Engineering Co., San Francisco, Calif. This company is affiliated with Western Machinery Co.

The heavy-media separation process is based on the use of a liquid pulp of high specific gravity. Rock, usually plus ¼ in. minus 2½ in., is fed continuously to the cone holding this liquid medium and in it the heavy rock sinks and the lighter rock floats. ROCK PRODUCTS has published several detailed articles on this process, among which might be mentioned "Sink-Float Process," October, 1948, page 100; and "Heavy-Media Separation Recovers Limestone from Zinc," November, 1951, page 64. The installation at Gabbs marks another milestone in the use of the heavy-media separation process in the rock products field.

The rock at Gabbs being treated ranges between 2.30 to 3.00 sp. gr., and using a liquid density of about 2.40, the brucite floats. The medium is made from a local magnetite iron ore. The loss of reagent is about 1 lb. per ton of rock treated. Three





Left: The low-head preparatory screen ahead of the separatory cone. Right: Apron feeder takes material out of the supply dump and discharges to the reclaiming belt serving the HMS plant

men operate the HMS plant, handling 50 to 90 t.p.h. of raw feed. With power requirements obviously low, the costs are well within the economics imposed.

The process was used in Canada on a gravel operation some few years ago (see February, 1950, issue of Rock Products, page 115) and another sand and gravel operation in the United States is using this technique to produce better aggregates at low cost.

#### Material Flow

At Gabbs, a short concrete tunnel was built at the toe of one of the larger piles and a reclaiming belt operates in it. The main belt is fed by an apron feeder. Rock is pushed over the reclaiming tunnel by a tractor and dozer. The rock is passed through a 15- x 38-in. jaw crusher and all material is elevated to a preparation screen mounted in the top of the heavy-media plant. This screen is a 5- x 12-ft. two-deck Allis-Chalmers low head and has a top deck with ½-in. and a lower deck with ½-in. openings. It operates wet.

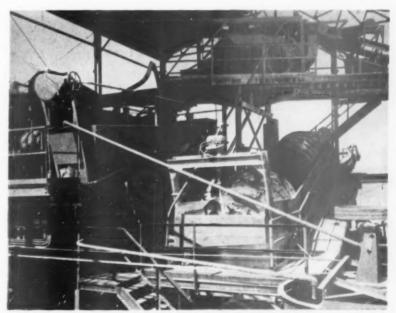
The oversize from both decks goes to the 14-ft. Wemco separatory cone where the brucite is separated from the gangue rock. The sink fraction is removed by an air lift that is inside the cone. The float fraction is removed by a tangential launder. Both the sink fraction and the float fraction next go to a 5- x 16-ft. Allis-Chalmers low head screen that is divided into two parallel screens by a division plate extending down the center of the screen parallel to its long axis. The purpose of this screen is to wash thoroughly all rock fractions to free them from adhering magnetite medium. In the 14-ft. cone is a slowmoving rabble arm that operates at 2 r.p.m. This is to maintain a more uniform specific gravity of the medium which is held at sp. gr. 2.39 at the overflow point and sp. gr. 2.45 at the underflow.

After washing, the brucite is belt conveyed to two steel truck loading bins and the material trucked to the railhead. The waste rock is belted to a disposal pile near the plant.

The fines from the second screen mentioned (minus 18 in.) flow to a 78-in. x 28-ft. Wemco dewatering screw. The overflow from this screw goes to a wooden thickener for reclaiming water.

The medium washed from the sink and float fractions follows the conventional process wherein it is recovered by Dings magnetic separators. Local iron ore is ground on the job to about 65 percent minus 100 mesh to be used in the make-up medium circuit.

To recover medium from the wash water, it first must be "flocculated." This is done by passing the pulp through a pipeline that is sandwiched between a coil-type Dings magnet. There are no moving parts to this magnet; the pulp simply flows through the magnetic field. It next goes to a size 40 Wemco thickener where the solids settle and are passed to a belt-type Dings magnet. Here solids are recovered very efficiently and are sent to a so-called "densifier."



After crushing, the material is elevated to a double-deck preparatory screen mounted on top of the HMS plant (top). The oversize from both decks of the screen goes to a separatory cone. The sink and floot fractions from the cone go to a low-head screen, from which the fines (minus 3/16 in.) flow to a dewatering spiral (right). To recover media from the wash water, the pulp flows through a magnetic field and then to a thickener where the solids settle and go to a belt-type magnet. Here solids are recovered and sent to a densifier (left) which acts as both a storage receptacle and feed device for returning recovered medium to the main circuit





A magnet (arrow) under the densifier deflocculates the medium before returning it to the cone. The magnet has no moving parts and the pulp simply flows between coils or the demagnetizing field

This is simply a short inclined screw conveyor which acts as both a storage receptacle and a feed device for returning the recovered medium to the main circuit. However, before the medium is returned to the 14-ft. cone, it must be "deflocculated," and to do this the pulp is simply pumped through another demagnetizing field. This disperses the pulp and restores its slow settling properties. The water from the magnet and from the thickener is sent to a stockhead tank for re-use.

The heavy-media plant is operated during the day shift only, so if desired the pulp can be kept in mild agitation by compressed air while the plant is not operating, or the cone can be dumped through a large lubricated plug valve at the cone's lower apex. If the cone is dumped at night, the solids in it collect in a concrete sump that is essentially the lower floor of the main building. On starting the plant after a shut-down, these solids can be sluiced to a bucket elevator and returned to the circuit. It takes about 10 min. to start operations after a shut-down. A U.S. Electrical gearmotor is used on the bucket elevator.

As a source of compressed air (should the main quarry source fail), a 10- x 11-in. Chicago Pneumatic air compressor, V-belt connected to a 40-hp. General Electric motor, is provided. As an additional safeguard—should the purchased electric power fail—this compressor has a Ford industrial gas engine as a stand-by power source.

The plant is of steel construction throughout and has a corrugated iron roof and sides. All units in the plant are driven by electric motors, controlled from a Cutler-Hammer push button switchboard conveniently mounted at a centrally located point.

Norman E. Hansen is general manager at Gabbs. Mr. Hansen has been associated with the parent company for over a quarter of a century and was formerly in charge of the company's Ohio plants. H. P. Willard is assistant manager. Fred Menzel is in charge of the heavy-media plant and R. E. Cannon is the plant operator and foreman. Mr. Menzel was formerly at Moss Landing, Calif., and at Gabbs also has charge of the kiln plant. A. M. Dixon is mine superintendent. The company's main office is in Cleveland, Ohio.

#### Warner Co. Report

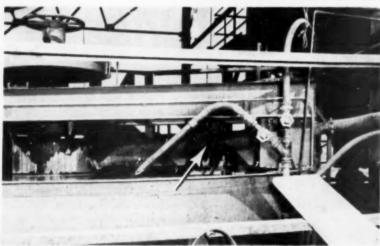
WARNER Co., Philadelphia, Penn., in its annual report to stockholders, reviewed its expansion activities and expenditures for the past year and predicted its business outlook for 1952.

In 1951, Warner Co. expended \$3,036,000 on extensive construction and equipment purchases. At the Cedar Hollow plant, a rotary kiln was installed to meet the increased demand for dolomitic lime products and to compensate for the abandonment of lime production at the nearby McCoy plant, which was sold in 1950.

Following research and pilot plant work, the first small commercial unit for manufacturing pure magnesia products for use in various chemical, industrial and pharmaceutical trades, was erected during 1951.

Other projects in 1951 included the addition of six steel barges to the company's Delaware river fleet, giving a total of 63 modern steel barges of approximately 1000-tons carrying capacity each. Considerable additional trackage, dry-bin and concrete-mixing facilities and ten new concrete-mixing trucks were provided in 1951 at the Morrisville plant.

Concerning its business outlook for 1952, the company predicted a decline of approximately 10 percent in its sales of ready-mixed concrete, due in part to government building restrictions. Sand and gravel sales, however, are expected to show an increase, while sales of lime and stone products are expected to remain about the same.



To recover medium from the wash water, it first must be "floculated." This is done by passing the pulp through a pipeline that is sandwiched between a coil-type magnet. The arrow points to the floculating coil ahead of the thickener. The pulp then goes to a thickener where the solids settle and are passed to a belt-type magnet.

Columbia Quarry Co. adds large trucks and uses dry-operated rotary drills at Columbia, III., plant



Above: Loading 22-ton diesel trucks in the quarry

Left: The side-dump truck bodies are hydraulically controlled. Here the units are dumping to the hopper serving the pan feeder at the primary crusher

### **Speeding Up Quarry Operations**

Columbia Quarry Co., St. Louis, Mo., has operations at Elsberry, Mo., Columbia, Valmeyer, and Ullin, Ill. Also, near Granite City, the company has a riprap operation. The Valmeyer operation is an underground mine. The quarry and plant (Krause No. 1) at Columbia continues to be the company's largest operation.

Stripping is one of the problems at Krause No. 1, for it is necessary to remove 25 ft. of soil, 40 ft. of yellow top rock and 30 ft. of gray top rock to get to 70 ft. of clean gray stone. The floor has 40 ft. of stone that may be used in the future. The gray and yellow top rock must be drilled and blasted and from it a small amount of commercial stone is recoverable. The operation produces riprap, commercial stone and agricultural limestone.

During November of 1951 the company placed in operation four 22-ton Autocar diesel trucks with Easton side-dump bodies. These hydraulically-dumped, cab-controlled units replace six older trucks that had bodies requiring overhead arrangements for dumping. It was the management's intention to use these trucks during off seasons for hauling strippings. However, most of the strippings are being hauled by a fleet of six 12-cu. vd. Tournatrailers.

The new Easton bodies hold 21 cu. yd. The round trip from quarry to primary crusher is 3000 to 4000 ft. over practically a level grade. The Autocars are fast. For primary loading there are two 111-M Marion shovels with 3½-cu. yd. buckets, a 93-M Marion with a 2½-cu. yd. dipper, and a 50-B Bucyrus-Erie with a 2-cu. yd. bucket. The latter two units are normally used for stripping. A new 6½-cu. yd. 4461 Marion Ward Leon-

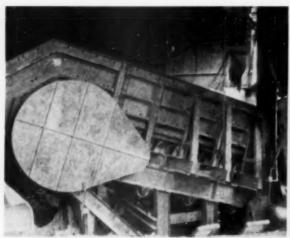


Loading rock into wagon pulled by a twowheel prime mover; these haulage units are used mainly to transport quarry overburden. A rotary drill rig can be seen on the rim of the quarry

ard electric shovel is expected to be delivered late in 1952.

For primary drilling the company uses two Joy rotary drills that drill 64-in. holes. They were originally wet drills and as such required up to 200 g.p.m. of water. Supplying this water and its final disposal was one of the objections to this type of drill, so dry drilling was adopted with improved over-all performance. With the wet units 15 ft. per hour was average, whereas the footage hour was raised to 17 by dry drilling. Bit life was increased about 300 ft. per bit. The holes are usually drilled to 72 ft. depth or about 2 ft. below the quarry floor. The extra footage is to accommodate chips in suspension. Bit life when operated dry is about 1000 ft. The compressor on the Joy drill is driven by a General Motors

Recently installed in the plant was a 72-in. Stephens-Adamson pan feeder to serve the 21-M Allis-Chalmers primary crusher. The Autocar sidedump trucks serve a truck hopper over this feeder. Secondary crushers in the plant are a 16-in. and a 10-in. Superior McCully gyratory. Final reduction is accomplished by a 4-ft. coarse Symons cone crusher and a 4-ft. short head augmented by a No. 636 Allis-Chalmers Type R. In the screening plant is a total of 16 vibrat-





Left: Pan feeder serving the primary crusher. Right: Electric power for the plant is generated by four diesels, one of which is shown here

ing screens, 11 Allis-Chalmers, three W. S. Tyler Ty-Rocks and two Stephens-Adamson. Two of this total are in the pulverizing section. All operate dry.

Electric power is generated at Krause No. 1 by a battery of four Superior diesels; horsepower ratings are 400, 525, 825 and 1000. Two of the diesels were installed in 1936, one in 1944 and one in 1946. The 1000-hp. unit was placed in service in 1944. Each diesel is directly connected to 480-volt, 25-cycle a-c generators. At peak loads all diesels are in service. The plant has a capacity of 500 t.p.h.

Six railroad switch tracks are below the plant with two sets of track scales so cars can be weighed as loaded from 20 bins above. Truck bins are available and these are filled by an Ohio crane. Above the plant and adjacent to a large spring the company has provided recreational facilities.

H. C. Krause is president of Columbia Quarry Co. and is also the new president of National Crushed Stone Association. C. H. Krause and W. E. Schmidt are vice-presidents and E. A. Heise is superintendent of Krause No. 1.

#### California Cement Production

DURING 1951, California cement plants produced a total of 29,937,000 bbl. of cement, valued at \$75,000,000, as reported by the California State Division of Mines. In 1950, the five northern plants produced 11,679,504 bbl., valued at \$28,167,050, and the six southern plants produced 14,597,-705 bbl., valued at \$37,091,655. One of the southern plants grinds and finishes clinker produced by other plants, so that only ten California plants actually produce clinker. All the plants lie within a 125-mile radius of the two principal marketing centers-San Francisco and Los Angeles.

The portland cement industry of California is said to be second only to the Pennsylvania industry in total production. Except for local or temporary shortages, the California plants have just about kept pace with the cement demand. Although no new plants have been built, existing plant capacities have been substantially increased.

Calaveras Cement Co., San Andreas, has carried on an almost continuous raw material exploration and plant development program throughout the postwar years, and has acquired new properties in the Cave City and Gambetta districts. Deposits lying north of the plant are currently being explored by diamond drilling. During 1951, new raw and finish grinding mills were installed and four slurry silos and four cement-storage silos were constructed.

Pacific Portland Cement Co. increased the capacity of its wet process plant at Redwood City by approximately 20 percent, through the modernization of older equipment.

Permanente Cement Co., Oakland, in 1951, completed the installation of a 12- x 468-ft. kiln, increasing plant capacity to 7,000,000 bbl. annually. New equipment, including raw-grind ball mills, stack, electric dust precipitator and increased finish-grind and air-separation facilities were also added to serve the new kiln. The kiln operates 50 percent on dust discharge from the electric precipitators and is in open circuit rather than closed circuit as the other four kilns.

Santa Cruz Portland Cement Co., San Francisco, is in the middle of a two-year stripping program to remove sandstone and shale overburden from its San Vicente Canyon limestone deposit. During the past year, the company made only minor changes in its dry process plant at Davenport, which has a capacity of approximately 2,000,000 bbl. per year.

ly 2,000,000 bbl. per year.

Monolith Portland Cement Co.'s
dry process plant at Monolith continued to produce at near capacity, which
is about 2,800,000 bbl. annually. The

finishing plant was reorganized and re-equipped in 1950.

California Portland Cement Co. made no major changes during 1951 in its dry process plant at Colton, but plans to build a new primary crushing department this year. The present 66- x 84-in. primary jaw crusher, which discharges 5½-in. rock, will be supplemented by a new gyratory crusher which is larger than most gyratory crushers currently in use. The plant includes a dust-eliminating system in which the dust is collected in a water bath, thickened, and then discharged onto a stockpile as a thick slurry. Plant capacity is about 5,000,000 bbl. annually.

Riverside Cement Co., with dry process plants at Crestmore and Oro Grande, is expanding operations at its Oro Grande plant and is carrying out long range exploration and development of raw materials at both plants. Two new 10- x 350-ft. kilns are under construction at the Oro Grande plant, similar to the three completed in 1948. Eight new stack and storage silos were recently completed and raw- and finish-grinding departments are being enlarged and new Multicone and electric dust precipitators are also being installed.

Southwestern Portland Cement Co.'s Victorville plant has undergone intermittent expansion since the early 1940's. During 1951, the company railroad was extended 7 miles to the newly developed quarries at Black Mountain, and new loading facilities were constructed. Other expansion in 1951 included the completion of a 10- x 350ft. kiln, reorganization and enlargement of the electrical system, addition of a preliminator ball mill to the finish-grinding department and a new rock-storage building. Present capacity of the wet process plant is 3,000,000 bbl. annually.

Blue Diamond Corp., Los Angeles, finish grinds clinker purchased from other plants for bulk and package delivery in the Los Angeles area.

### **Crushing Practice and Theory**

Part VIII. Crushing rolls and their use

ALTHOUGH THE TERM "crushing rolls" might, logically, include roll crushers of the sledging type, the name, by popular usage, is restricted to the double-roll machine (with either smooth or corrugated shells) which crushes entirely by pressure between the surfaces of roll faces. The sledging type of either single- or double-roll arrangement is usually differentiated by such titles as "roll crusher" or "sledging rolls."

The only point of similarity in the actions of the crushing rolls and the gyratory and jaw types is that both do their crushing by pressure. As contrasted to the action of gyratory and jaw types, rolls have a contin-uous "one-bite" action; once a particle of material is firmly gripped, it is drawn down between the converging shell faces in one quick, continuous "squeeze," until the discharge point is reached. Another point of difference is that the rolls do not rely upon gravity to work the material down through the crushing zone; the action is a forced, mechanical one.

Still another difference between the types is that, in the crushing rolls, there is no "close-side" and "openside" discharge setting; the distance between roll faces-on a line between the two shaft centers-establishes the discharge opening, which remains unchanged during normal operation.

Mechanically, a pair of crushing rolls is a simple machine. Fig. 1 and 2 show all of the essential details of construction of a heavy-duty machine. A heavy and rigid cast-iron frame supports the two-roll assemblies, each of which comprises a shaft, a roll center, and a shell of wear-resisting metal, such as high-carbon steel, or manganese steel. Each roll is independently driven by a fly-wheel type, flat-belt pulley, or V-belt sheave. One of the two pairs of bearings is arranged to slide horizontally on the side frames. These movable bearings are spring-loaded to provide a safety relief for excessive pressures, such

By BROWNELL McGREW®

THIS IS A RESUMPTION of a series of articles begun in the June, 1950, issue of ROCK PROD-UCTS. The last previous installment of the series was in June, 1951. Unforseen difficulties interrupted publication, but the editors now have in hand all the remaining articles of the series. Previous articles covered the more common types of jaw and guratory crushers, together with the theories governing their selection for various kinds of operation.

THE EDITORS

as are caused by tramp iron, etc. They are drawn up against locating shims which establish the spacing between roll faces (discharge setting), and are held in that position by the springs, which are pre-set to the working pressure for which the particular machine is designed. This working pressure may vary from as low as 500 lb. per lin. in. of roll face, for light-duty rolls, to as high as 15 tons per in. of roll face for extra-heavy-duty rolls.

So long as flat belts were the established driving medium, it was customary to equip the fixed roll with a large pulley, and the movable or spring roll with a smaller one-generally one-half the diameter of the large one. The large pulley was designed to carry the full amount of power needed to drive both rolls, which of course relegated the smaller one to the status of an idling pulley; its sole purpose was to bring the spring roll up to speed, and to maintain that speed during idling periods.

There was a logical purpose behind this arrangement. Because of the variables involved, it would be the exception, rather than the rule, if both roll faces ran at exactly the same speed under no-load conditions, and if this "slip" between faces continued when the rolls were loaded, wear on the shell faces would be greatly accelerated. The large-andsmall pulley set-up permits the material to "gear" the shell faces together so that the speeds are the same, and any compensation that might be required in surface speeds is taken care of by belt slippage on the small pulley.

When the multiple V-belt drive came into its own, and line-shaft

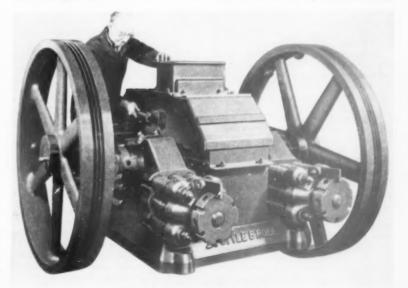


Fig. 1: General view of a pair of crushing rolls

\*Allis-Chalmers Manufacturing Co., Los Angeles, Calif., district office.

Previous articles in this series were published in Rock Products as follows: Part I, June, 1950, page 118: Part II, September, 1950, page 915; Part III, October, 1950, page 16; Part IV, November, 1950, page 62; Part V, December, 1950, page 62; Part V, 1951, page 106; Part VII, June, 1951, page 118.

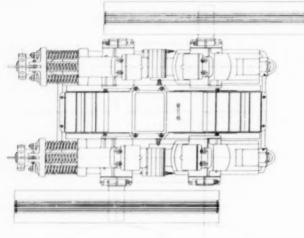
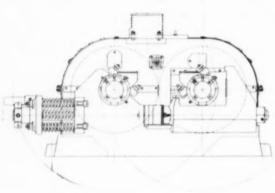
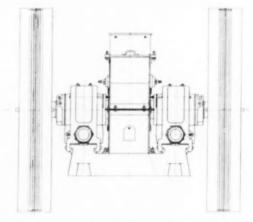


Fig. 2: Detailed drawing of one style of crushing rolls





transmission was replaced by individual motor drives, an improved driving arrangement for crushing rolls was developed. V-belt sheaves of equal size were installed on both rolls, and the load was divided between two motors. With this system, any speed compensation which may be required is taken care of automatically by increased slip of whichever motor happens to be driving the roll with highest no-load peripheral speed.

Although crushing rolls fitted with corrugated shells have been used in some special applications for secondary crushing, they are essentially a fine-reduction crusher, and as such are always fitted with smooth-face shells. The maximum one-way dimension of feed size is established by that point at which the rolls will nip the feed. This, in turn, depends upon the coefficient of friction of the material, the diameter of the rolls, and the spacing between roll faces.

#### Feed Size and Roll Diameter

The diagram in Fig. 3 shows the method used in calculating maximum feed size for any diameter of rolls; the accompanying table gives a listing of feed sizes for standard diameters. These figures are based upon zero roll spacing; therefore the distance between faces (i.e., the dis-

charge spacing to be used) should be added to them to obtain the maximum feed size for any combination of roll diameter and setting. The calculations are predicated on a coefficient of friction of 0.3, which is safe for most materials, provided that the surface speed of the rolls is not too high.

#### Capacity Formula

The theoretical capacity of crushing rolls is arrived at simply by calculating the volume of the ribbon whose cross section is the area of the discharge opening, and whose length is the peripheral speed of the roll faces per unit of time. The formula, for material weighing 100 lb. per cu. ft., is:

$$\frac{D \times W \times S}{48} = \text{tons per hr.}$$

Where: D=space between roll faces, in inches;

W=width of roll faces, in inches;

S=peripheral speed of rolls, in ft. per minute.

This "full-ribbon" formula gives results which cannot be achieved in practice, except for special conditions of choke-feed on small material, where the rolls are forced apart by pressure of the material, thereby thickening the ribbon. For the more usual condition of regulated feed the results must be divided by a service factor to arrive at a conservative estimate of capacity. For heavy-duty rolls, a factor of 3 may be used; for light and medium-duty rolls, it is safer to divide by 4. These compensating factors may be inserted in the formula by using divisors of 144 and 192, respectively, instead of the regular divisor of 48.

#### **Peripheral Speeds**

Several factors enter into the determination of the maximum practicable surface speed of crushing rolls. These are:

- (1) Size of the feed (maximum one-way dimension);
- (2) Crushing strength of the material;
  - (3) Diameter of rolls;
- (4) Spring pressure, and weight of the machine;
- (5) Coefficient of friction of the material.

The ways in which these factors influence roll speeds may be stated briefly as follows:

- (A) For any given roll diameter, the advisable maximum speed is an inverse function of the size of the feed.
  - (B) For any given size of feed, the

permissible speed is a direct function of the roll diameter.

(C) For any combination of feed size and roll diameter, heavy-duty, high-spring-pressure rolls will stand higher speeds than will lighter rolls, provided that the angle of nip is not too great for the increased speed.

(D) In any given machine, soft, friable materials may, within the limitation suggested for (C), be handled at higher speeds than hard and tough materials.

A certain amount of momentary slip of the individual particles of material will occur in any set of rolls, regardless of diameter or size of feed. This slip is due primarily to the difference in velocity of the particles and the roll faces at the moment of nip; the obvious tendency is for the slip to increase as the surface speed increases: also, it will increase as the angle of nip is increased. Hence, to hold the slip within reasonable limits, the angle of nip must be decreased as the speed is increased. The feed size being a fixed quantity, for any given application, the only way to decrease nip angle is to increase the roll diameter.

Shocks incidental to shattering the particles of any given size of feed increase with speed, and with the crushing strength of the material. Large-diameter rolls, because of their greater mass, can absorb these shocks better than smaller, lighter rolls; therefore they are more suited to high-speed operation. It is equally clear that high-spring-pressure, heavy-duty rolls are better fitted, because of their superior shock-absorbing capabilities, to stand up to high-speed crushing than rolls of more modest proportions.

Lastly, we have the character of the material to consider; that is, its resistance to crushing and its coefficient of friction. Except for occasional special cases the latter is not apt to diverge greatly from the normal; therefore it does not as a rule inject any special complication into the problem. On the other hand, hardness and toughness do vary widely and must be taken into consideration in selecting the proper size and class of rolls.

It would be exceedingly difficult, if not impossible, to incorporate all of these variables into one comprehensive chart or formula. It can. however, be done for one type-or duty-class-of rolls if we assume a reasonably uniform coefficient of friction and base our values, for safety's sake, on hard rock. Such a chart is shown in Fig. 4. This chart was prepared for rolls of the heavy-duty class, with spring pressures in the approximate range of 5 to 8 tons per in. of face. Extra-heavy rolls may be run at somewhat higher speeds than indicated by the values given, unless the rock is extremely hard. Rolls of the class for which the chart was

prepared may be run at higher than indicated speeds if the material is soft and friable. Light-duty rolls, on the other hand, should not be run at higher than indicated speeds on soft rock, and should be run somewhat slower on medium hard material. Light-duty rolls should not under any conditions be used for crushing hard rock or ore.

The chart (Fig. 4) may be used in another way, by adhering to the values given for speed vs. feed size, and selecting the class of rolls to suit the crushing characteristics of the material.

#### **Reduction Ratio**

A great deal has been written, and said, about the limitations of the crushing rolls in the matter of reduction ratio, and there has been a tendency to pin the machine as a class down rather definitely to fixed maximums, regardless of any variables in conditions and characteristics of the materials to be crushed. For many years—apparently by virtue of general consensus—it has not been deemed advisable to exceed a ratio of reduction of 4:1, and seldom was any exception noted in stating this rule.

The permissible—or advisable—reduction ratio for crushing rolls is subject to variation, just as it is in the

other types of crushers. Light rolls are not capable of handling reductions as large as those which can be successfully performed in heavy machines. For a given size of feed, the large-diameter rolls will successfully handle higher reductions than will rolls of smaller diameter. And, for any particular machine, the permissible reduction ratio will vary inversely with the hardness or toughness of the rock.

The quality of product required has an important bearing upon the advisable reduction ratio. The way in which the crushing rolls perform their work, i.e., the continuous "follow-through," once they have gripped the material, tends to create a "choke" condition in the discharge zone-a condition which would obviously be accentuated as the reduction ratio is increased. Inasmuch as such a condition promotes production of fines, it follows that a high reduction is undesirable if minimum fines are a requirement. For most commercial crushing plant applications it is advisable to hold the ratio within 3:1, rather than 4:1.

On the other hand, if the rolls are being used to prepare feed for finegrinding units, fines are helpful rather than harmful. For such applications the permissible reduction is established by the ability of the in-

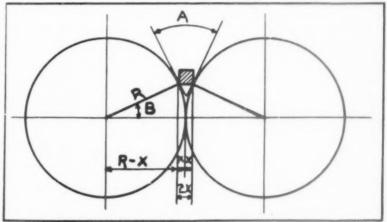


Fig. 3: Diagram for calculating maximum food size for any diameter of rolls

Let	R=radius of roll
	A=wedge angle (31 deg.)
	B=friction angle (16 deg. 45 min.
	Coefficient of friction is 0.3
Size	of pieces rolls will take = 2X
	p v

	R
Roll diameter, in.	Size of pieces, in.
9	0.36
12	0.48
18	0.72
24	0.96
26	1.04
30	1.20 Plus the spread of the rolls
36	1,44 equals maximum size of
40	1.60 pieces which rolls will take
42	1.68
48	1.92
54	2.16
70	2.22

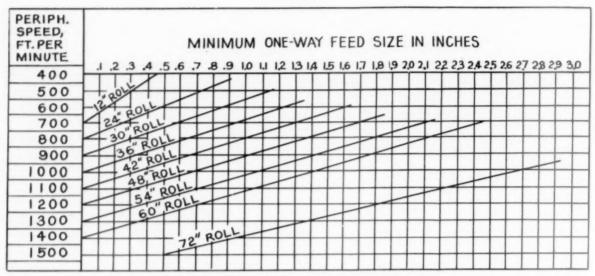


Fig. 4: Peripheral speed—diameter—feed size chart for crushing rolls

dividual machine to handle the job. Reductions of 6 or 7 to 1 are not uncommon for such operations utilizing heavy-duty rolls. Higher reductions than this are being performed in closed-circuit operations, running the rolls with a heavy choke-feed and a high circulating load. Such a performance, it should be stated, can only be economically performed on soft rock or ore.

#### **Power Requirements**

The power required to drive crushing rolls varies with the hardness of the material, capacity, and ratio of reduction. On hard material the power consumption, for a reduction ratio of 4:1, will average approximately one horsepower-hour per ton of hourly output; for example, a machine producing 50 tons per hr., handling 2-in. feed, and set to 1/2-in. discharge spacing, will require approximately 50 hp. to drive it. For soft, friable material this figure may be reduced as much as 50 percent. The power will vary approximately in direct relation to the reduction ratio.

#### Product

The character of product delivered by crushing rolls may vary quite widely on the same material. We have mentioned that a low reduction ratio is advisable if a minimum percentage of fines is desired. A light feed, i.e., a low rate of feed, will usually result in a cleaner product because the material does not become so closely packed in the choke-zone. Conversely, a choke-feed promotes production of fines; the rock is crowded into the choke-zone so rapidly that voids are eliminated, and the normal operating condition in this zone amounts to what in a jaw or gyratory crusher would be a full-choke. In the rolls it is relieved by the movement of the

spring roll, which crowds back against the spring pressure when the unit pressure in the crushing zone exceeds the pre-set working pressure of the springs. Heavy-duty rolls can be operated in this way with good results, especially when run with high circulating loads in closed circuit with screens.

The tendency of rolls to create a packed condition in the choke-zone may sometimes have an unfavorable effect on the product. If the material is both soft and adhesive it may be discharged in cakes, which are sometimes quite hard and difficult to disintegrate in other apparatus. Caking can be minimized by using a low ratio of reduction per stage, and a regulated feed to avoid excessive packing.

Some materials-notably, those of sedimentary origin-contain numerous parallel cleavage lines. Such materials are almost certain to "flake" in crushing rolls; that is, the product will contain a sizable proportion of flat spalls. While this is of no particular moment in some products, it is a serious detriment in others, such as concrete sand for example. When a cubical product is essential, and rolls are in all other respects suitable for the proposed application, laboratory or field tests should be run on the material to determine if the rolls will turn out such a product.

#### **Applications**

Although a portion of the field formerly dominated by crushing rolls has been pre-empted by newer machines of other types, there are a number of applications for which the rolls are eminently adapted. There is a gap, for example, between the economical product ranges of the gyratory fine-crusher, on the one hand, and the ball mill or rod mill, on the

other, which the rolls fill effectively. They are used for making granules and grits, and have been successfully applied to the production of manufactured sand for concrete aggregates.

Although rolls never attained any great degree of popularity in the commercial crushed stone industry, a number of sets are being used for low reduction ratio recrushing in stone and gravel plants. In this application they are quite successful. They are also well adapted by virtue of their forced-feed action to the handling of soft and sticky materials, such as rock asphalt, although as has been noted, some materials of this nature will cake in the rolls.

It is in the realm of ore dressing that crushing rolls found their greatest field of application, and, although a portion of this field has been taken over by the modern high-speed gyratory crusher, and some of it eliminated by changing methods in concentration practice, a large number of rolls are still in active service in ore dressing mills throughout the world. Some experienced operators favor them in preference to any other type of crusher for the final crushing stage ahead of fine-grinding ball mills, as one example. They are also used in many mills to prepare the ore for coarse concentration, prior to further grinding for flotation or other recovery processes. Crushing rolls require a certain amount of skill and experience to obtain the best and most economical performance from them, and the mining man has learned through his years of experience how to operate them and care for them.

Except, perhaps, for the occasional low-capacity specialty application, the economical limit of product size for crushing rolls is about No. 16 mesh on soft and medium rock, and No. 8

(Continued on page 102)

# Sand and Gravel



The spillway will be capable of carrying 456,000 sec.-ft. of water. At left is the batching plant that serves both the Mexican and United States sides of the dam. The control towers in the background are about level with the top of the dam

# **Gravel Aggregate for Falcon Dam**

United States and Mexico build international dam on Rio Grande. Concrete design varies between countries. Three sizes of coarse aggregate produced and pozzolanic materials used extensively

FALCON DAM, now under construc-tion on the lower Rio Grande river, is the first of three major international storage dams to be built jointly along this river by the United States and Mexico under provisions of the Water Treaty of 1944. This treaty provides for cooperation between the two countries in the utilization of water. It fixes the rights of the two countries to the waters of the Rio Grande river and also to the Colorado river. An international agency, the International Boundary and Water Commission, is charged with application of the treaty. Headquarters of the United States section of the commission are in the First National Building, El Paso, Texas. L. M. Lawson is the U.S. Commissioner. Headquarters of the Mexican section are at Avenida Lerdo 219 Norte, Ciudad Juárez, Chihuahua, Mexico. The Mexican Commissioner is David Herrera Jordán.

#### Purpose of Dam

Falcon dam, the lowermost of the proposed major dams and reservoirs, will impound the flood waters of the Rio Grande which in 1932 reached 198,800 second feet passing Rio Grande City, a few miles below the site of Falcon dam. Yearly, millions of acre-feet of water are wasted into the Gulf of Mexico, and it is this dam that will help correct a very serious agricultural situation.

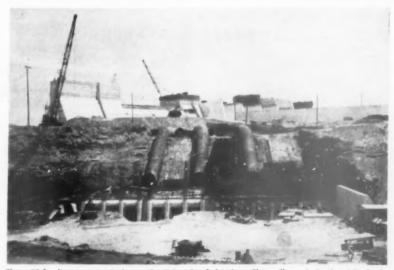
Construction of the dam is being carried out by the two countries by

# By WALTER B. LENHART

allocation of work. Each bears its share of the cost in proportion to the conservation storage capacity allocated to it. On this basis 58.6 percent of the cost falls to the United States, and 41.4 percent to Mexico. Construction work is by two separate contracts, one for Schedule No. 1 awarded by the United States section

of the commission, and the other for Schedule No. 2 awarded by the Mexican section and the Ministry of Hydraulic Resources of Mexico. All work is supervised by the joint commission, each section exercising direct supervision over the work performed under the contract awarded by it.

Actually, the work program is simpler than this sounds for one organization has both contracts, operating as Falcon Dam Constructors for the



Three 13-ft. diameter penstocks on the U.S. side of the dam. The spillway is in the right background. The greater portion of the concrete is on the U.S. side





Left: A continuous stream of bottom-dump units being loaded with fill material. Right: Two tractors pull the self-loader for stripping fill material.

Trucks pull up alongside the loader one after the other; loading proceeds at the rate of 1000 cu. yd. per hr.

work assigned to the United States and as Constructora Intercontinental, S.A., for the work assigned to Mexico. One aggregate processing plant and one concrete batching plant supply both the Mexican and the United States sides. The immediate area has been set aside as an international zone and an interchange of some equipment is practiced, particularly excavating and earthmoving equipment. Falcon Dam Constructors is made up of a group of seven United States contracting companies: C. F. Lytle Co., Sioux City, Iowa; Amis Construction Co., Oklahoma City, Okla.; San Ore Construction Co., McPherson, Kan.; Foley Bros., Inc., St. Paul, Minn.; Massman Construction Co., Inc., Kansas City, Mo.; Tel-lepsen Construction Co., Houston, Texas, and Edward Peterson Co., Omaha, Neb.

Tellepsen Construction Co. is more

directly concerned with the concrete work and Massman Construction Co. with the earthmoving and riprap procurement. R. W. Ward is the United States Section project engineer at Laredo, Texas. R. B. Collons is construction engineer, C. E. Dyer is office engineer, Robert E. Bickel is assistant field engineer and Charles Southwell is concrete technologist, all at the Falcon dam site and all responsi-ble to the United States Section of the international authority. Mexican section personnel includes Oscar Gonzáles Lugo, construction engineer, and Carlos Molina R., assistant construction engineer. A. M. Croxon is project manager for Falcon Dam Constructors and Harry Zachau is concrete superintendent. Frank Wilson is superintendent of aggregate production.

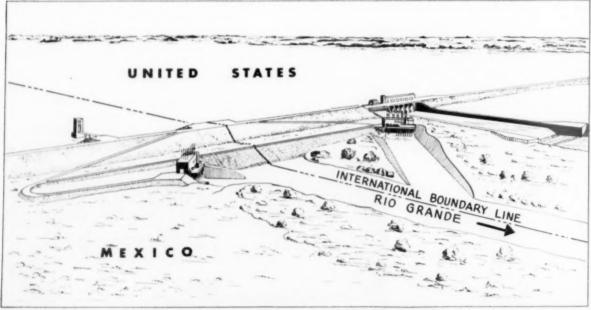
The Bureau of Reclamation designed the dam and related structures

and is acting as technical consultant.

#### Materials

The United States Section to a large extent uses the bureau's specifications for concrete. A pozzolanic material is added at the mixer to correct any possible reactive material in the aggregates when used with a high alkali portland cement and to act as a portland cement replacement. A calcined and ground volcanic ash manufactured at Rio Grande City is used as the pozzolanic material. This additive is made by the Valley Brick and Tile Co.

Specifications for the additive call for a fineness of 8000 sq. cm. per gram, but it was said that material as fine as 14,000 sq. cm. per gram had been provided mainly through overgrinding. For the structural concrete 25 percent replacement of portland cement by pozzolan is made,



Falcon dam and power plant on Rio Grande as it will appear when completed



Upstream face of control gates; the batching plant is at the left and the sand and gravel plant at extreme right. Concrete is batched in the plant on the Texas side of the river; the aggregates are processed on the Mexican side. The completed dam will be almost 5 miles long

and 35 percent for the mass concrete. A 3.3-bag mix is used in the mass concrete and for the structural roughly 4.0 bags of cement per cu. yd. of concrete are used. In the early concrete placing stages some sections of concrete were placed using considerably less pozzolan than indicated here; this stemmed from uncertain delivery problems, all of which have now been corrected.

Air-entrained concrete is used by both the Mexican and the United States sections. Both Dur-Air and Protex are used. Portland cement for the United States section comes from the Corpus Christi, Texas, plant of Halliburton Portland Cement Co. A Type II modified portland cement is used. For the Mexican section a slag cement made by Cementos del Norte, S.A., made at Monterrey, Nuevo León, Mexico, is used.

## **Concrete Design and Production**

Concrete for both sides is batched in a plant located on the Texas side of the Rio Grande. It comprises a battery of four 4-cu. yd. Smith mixers and Johnson fully automatic batching equipment. Ice manufactured at the damsite is the cooling agent; most of the concrete is placed at night to avoid heat as much as possible. Concrete on both sides is cured by the use of Seal-tex, a white curing compound. Concrete is placed at the average rate of 1000 cu. yd. per day, 1650 cu. yd. being the top production figure to date.

On the Mexican side no mass concrete is involved—all is structural and a 4.25-bag mix is used with specifications calling for 3500 p.s.i. concrete at 28 days. On the United States side the mass concrete tests 2900 p.s.i. at 28 days, and the structural concrete 3900 p.s.i. at 28 days. Only a few 90-day tests have been made but these show roughly a 500 p.s.i. increase for the mass concrete and 300 p.s.i. increase for the structural. This testifies to the effectiveness of the pozzolan used. Eleven



A 4- x 12-ft. scalping screen wastes the plus 3-in. material at the aggregate plant. Note the relatively small pile of waste. The material is then belt conveyed to a scrubber. The deposit is high in fines and considerable sand and pea-sized gravel is wasted



A battery of four 4-cu, yd. mixers and fully automatic batching equipment are used at the batching plant



Aggregate plant at Falcon dam. The main plant (right) is semi-portable; scalping screen is at left

main mixes are used at the Johnson batching plant to comply with Mexican and United States specifications. A study of the concrete in this structure in the years ahead could prove very interesting because of the obvious differences in concrete design and in the variable amounts of pozzolan used in the U.S. Section at early pouring dates.

The dam will involve a total of 261,000 cu. yd. of concrete for both sections. The greater yardage will be on the Texas side, for on that side is located the spillway which will be capable of carrying 456,000 second feet of water—2½ times more than any recorded flood on the lower Rio Grande.

The structure will be one of the longest dams in the world, for its total length will be 26,294 ft., only a few feet short of 5 miles. Its maximum height above stream bed will be 150 ft. with a crown width of 35 ft. A road will cross the dam along the crest. From the inside toe of the lower section of the dam to the outside toe will be roughly 1000 ft. The earth fill volume is estimated to be 12,500,000 cu. yd. Where necessary riprap will be used; the 420,000 cu. yd. required is being obtained on the Mexican side of the river and entails a truck haul of 11 miles. The riprap

is a hard, durable sandstone, and specifications require material from 1 cu. ft. to 1 cu. yd. in size. Not over 25 percent is to be less than 1 cu. ft. and at least 25 percent is to be larger than ½ cu. yd. in size. Fragments will fill the voids.

#### **Earth Fill Construction**

For hauling the large amount of earth fill required, the Falcon Dam Constructors has a large fleet of 13-cu. yd. and 25-cu. yd. Euclid bottom-dump semi-trailers. P&H and Bucyrus-Erie shovels do some of the loading along with a Euclid "self-loader." The self-loader is well fitted for stripping great yardages of certain types of materials at a very fast rate. The machine consists essentially of a horizontal blade and a side-cutting vertical blade. Two RD-8 Caterpillar tractors pull the machine, the vertical blade cutting a swath about 1 ft. wide and 10 ft. high. The blades also serve to collect the loosened material and feed it onto a wide inclined belt conveyor. The machine is mounted on roller tracks. Trucks pull up alongside the unit one after another, and loading proceeds at the rate of 1000 cu. yd. per hr. The material is a fine loam relatively easy to handle. The self-loader was used on both the Mexican and the United

States sides of the river. The fill material was spread over the damsite in a thin layer and adequately compacted. The center of the dam is an impervious core.

#### Aggregates

Aggregates for all concrete work are processed on the Mexican side and hauled to the batching plant as needed in Euclid end-dump trucks. The plant is extremely simple but highly efficient. It is a No. 403 Pioneer Continu-Flo semi-portable gravel processing plant, augmented by a 4- x 12-ft. dry, Cedarapids scalping screen from which all plus 3-in. material is wasted. The amount wasted is relatively small.



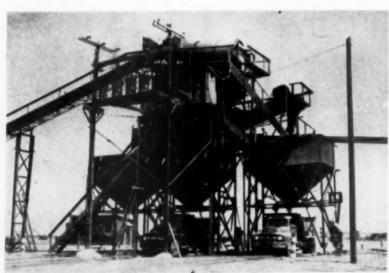
Dragline leading trucks at the sand and gravel pit

Three sizes of coarse aggregate are first scrubbed and then wet screened. These sizes are plus 1½ in. minus 2½ in.; plus ½ in. minus 1¼ in., and plus No. 4 minus ½ in. One size of concrete sand is produced. It is a minus ¼-in. material and no specifications are given for any F. M. requirements, but a figure of 3.05 was considered to be average production.

Specifications for the sand are as follows:

Sieve Size U.S. Standard	Percent Retained	Percent passing
4 8 16	0-5 10-35 10-25	
30 50	10-20	0-80 15-30
100 200		0-5

The pit-run material is first scalped dry to get rid of the plus 3-in. size, after which the material is belt conveyed to a 72-in, x 12-ft, scrubber. A 4- x 8-ft. wet, double-deck Pioneer screen is the first wet scalper and a three-deck wet 4- x 12-ft. screen of the same make does the final sizing. Sand is prepared by two 21-in. dia. sand screws. Production is at the rate of 1500 cu. yd. per 10 hr. Some sand is wasted and the excess pumped to final disposal areas by a 6-in. Hetherington & Berner sand pump. The deposit is high in fines, and besides wasting considerable yardage of sand, much pea-sized gravel is also wasted. Water for the plant is pumped from the Rio Grande



Close-up of main aggregate plant. Three sizes of coarse aggregate are first scrubbed (rotary scrubber at top) and then wet screened. One size of concrete sand is produced

to a reservoir by a 10-in. Gould pump; an 8-in. pump delivers water to the scrubber and screens.

Truck loading in the pit is by means of a Northwest dragline with 5-cu. yd. Hendrix bucket. Under the truck hopper is an apron feeder serving the plant. An RD-8 Caterpillar tractor and dozer pushes excess material into the truck hopper. The finished aggregate is hauled about two miles to the batching plant.

#### **Power Production**

Two power plants are being built, one on the Mexican side and one on the United States side. Each will have three 10,500-kw. generators. Each power plant will contain three vertical-shaft, Francis-type turbines, each of which is capable of developing 14,750 hp. at a rated head of 100 ft. and at a speed of 163.6 r.p.m. Each plant will have a centralized control room with independent facilities, though the two will be interconnected for transfer of electrical energy.

The total storage capacity of the reservoir to be formed behind the dam will be 4,085,000 acre-ft., of which the lower 300,000 acre-ft. will be silt storage. The conservation storage will be 2,100,000 acre-ft. with a flood storage of 1,685,000 acre-ft. The normal surface area of the reservoir will be about 78,000 acres with a maximum of 113,000 acres. The land to be innundated by the reservoir is practically all native brush-covered. The present upstream limit of the productive agricultural area to benefit by this dam begins near Rio Grande City, which is about 29 miles downstream from the dam.

### **Motor Selection Course**

A 35-MM., BLACK AND WHITE, SOUND SLIDEFILM and allied literature on "Selection and Application of Fractional Horsepower Motors" has been added to General Electric Co.'s Motor Selection Course, a training program launched in 1951 as No. 22 in the G-E "More Power for America" series.

The 21-min. film describes the various uses of fractional horsepower motors in factories, in the home, on the farm and in offices. It outlines the five basic steps that should be considered in selecting and applying any motor and shows how they work in fractional horsepower sizes. It tells how to (1) study the driven machine; (2) determine the motor horsepower; (3) determine the electrical characteristics; (4) determine the control equipment; and (5) determine mechanical design features.

The Motor Selection Course consists of ten slidefilms, student review booklets of the lessons and an instructor's manual. The complete course is available for single showings or may be purchased outright from the company.

# Foreign Cement Production

ARGENTINA: Production of portland cement totaled 1,542,525 metric tons in 1951, a 1 percent decrease compared with the 1950 output. The decline was due to transportation difficulties and inability to obtain replacements of existing machinery. Domestic output was supplemented by imports of 429,089 tons, chiefly from Chile, Germany and Poland.

BRAZIL: The country's ten portland cement plants operated at maximum capacity during 1951, producing approximately 1,450,000 metric tons, or about 4 percent above the 1,381,976 tons produced in 1950. Eight new plants with an aggregate annual capacity of 712,000 metric tons are now being planned or are under construction.

A slag-cement plant, Cia di Cimento do Vale do Paraiba at Volta Redonda, Rio de Janeiro State, was inaugurated in December, 1951, to utilize slag from the steel furnace of Cia Sidergica Nacional. This is said to be the first plant in South America to produce this type of cement which is used chiefly for dams and other massive construction.

Cement mills in Sao Paulo were handicapped in 1951 by inadequate deliveries of gypsum. Shortages of cement reached severe proportions in October and November, necessitating military occupation of the larger plants in order to combat the black market in cement and to force observance of price controls and allocations. An estimated 595,513 tons of portland cement were imported in 1951, which increased domestic consumption to 2,046,000 tons.

A new cement plant in Rio Grande do Sul began operations in March, 1952. Annual capacity is 150,000 tons. The new plant at Volta Redonda, also with a capacity of 150,000 tons, is expected to start production by the end of 1952. With the production from the new plants and the expansion of six existing plants, total production is expected to be increased by 424,000 tons per year.

ITALY: Italian cement production for the first four months of 1951 totaled 1,570,000 tons, an 11 percent increase over the comparable 1950 period. Cement exports for the same period in 1951 amounted to 45,700 tons, a 17 percent increase over the first quarter of 1950.

The largest cement producing group in Italy is Italeementi, S.A., which operates 20 cement plants throughout Italy. This group controls between 50 and 60 percent of the total Italian cement capacity. Italeementi has undertaken an expansion program which, when completed, will increase capacity from 9910 tons per day to 12,595 tons. The expansion includes a new plant recently placed in operation at Catanzaro Sala, Calabria and new plants being built at Catania

and Trieste. Other expansion includes the installation of new equipment at plants located at Borgo S. Dalmazzo, Cagliari, Calusco d' Adda, Salermo, Senigallia and Trento. Plants of the Unione Marchino at Piacenza, S. Arcangelo Romagna, Guidonia and Scandiano are also being expanded.

Northern Rhodesia: The Chilanga Cement Works, with an estimated capacity of 55,000 long tons per year, began operations in July, 1951. By the end of 1951, the plant was producing approximately 900 tons per week. Plans are now being made for the installation of another kiln, which is expected to triple the plant output. A new plant near Lusaka, with an annual capacity of 55,000 tons, was also placed in operation in 1951

Southern Rhodesia: Cement was in short supply during most of 1951. Rhodesian Cement Co., Ltd., was considering establishing a new plant at Shamva if limestone deposits there proved adequate for maintaining profitable cement production. If the limestone deposits were found to be inadequate, the company planned to increase production at its Colleen Bawn plant which, at that time, was already being doubled in size.

The production of Rhodesian Cecent Co., Ltd., and of Premier Portland Cement Co., Ltd., during 1951, was about 8000 tons per month each. Estimates indicated that by mid-1952, production would be increased to 15,000 tons per month at the Rhodesian plant and 12,000 tons at the Premier plant.

Rhodesian Cement Co. is also establishing a new plant at Gwelo for the manufacture of a special low-heat cement which would be suitable for mass concrete work for projects such as the Kariba Gorge dam. Plant capacity will be approximately 200,000 tons per year.

These reports were taken from Mineral Trade Notes, published by the Bureau of Mines.

#### Cement Price Increase

CALAVERAS CEMENT Co., San Francisco, Calif., recently announced that it has been granted an increase of \$0.15 per bbl. in the price of its gray cements. Calaveras is believed to be the first company in the nation to be granted a cement price increase by O.P.S. under the Capehart Amendment. The company intends, however, to continue charging present prices until the increase is authorized on an industry-wide basis.

#### Changes Name

NEENAH-MENASHA SAND & GRAVEL, INC., Neenah, Wis., has changed its firm name to Schulz Sand & Gravel, Inc.

# Crushed Stone



Screening tower and secondary crushing plant (left) at Superior Stone Co.'s Augusta, Ga., operation. Note the two return belts, one for each cone crusher; toe of the surge pile is at right

Superior Stone Co. processes a hard quartzite aggregate for big South Carolina program

# PRODUCING AGGREGATES FOR ATOMIC ENERGY CONSTRUCTION PROJECT

LATE IN JUNE of last year the Superior Stone Co. placed in operation its new plant located near Augusta, Ga. Most of the plant's output is going into the atomic energy development work in connection with the hydrogen bomb program now underway across the Savannah river from Augusta and centering near Aiken, S.C. This huge program has nearly \$2 billion in funds earmarked for it, and a large amount of concrete is involved for access and service roads and other forms of construction. Ready-mixed concrete operations in the area are said to be breaking world records for the yardages being placed.

The Superior Stone Co. quarry is locally referred to as the "city quarry," for many years ago the city of Augusta operated it. At that time the stone was barged down a canal that runs alongside the deposit. The canal still exists but little, if any, water transportation of any kind now is used. The canal parallels the Savannah river. The rock is classed as a quartzite and is quite hard, producing an aggregate highly acceptable to the Atomic Energy Commission, the prime contractor, E. I. du Pont de Nemours & Co., and to state and local users.

A considerable amount of stripping is necessary to handle up to a maximum of 35 ft. of overburden, although there are a number of areas where only a few feet of stripping is required. The area is slightly rolling with brush and small trees in abundance. The strippings are mostly soil-like in nature and present no

particular problem outside of volume.

Drilling is done by Ingersoll-Rand wagon drills with 40 percent Du Pont powder as the explosive. Holes are detonated with Primacord. At the time of inspection the Du Pont explosives division was superintending the loading and firing of a primary shot. Air for the wagon drills was produced by three 600-c.f.m. Ingersoll-Rand rotary air compressors.

For primary loading there are three 80-D Northwest shovels and these load to a fleet of 25-ton capacity rear-dump Euclid trucks. The haul is uphill but of moderate grades. The trucks dump to a hopper under which is an apron feeder that serves the 5- x 12-ft. twodeck F-900 Ty-Rock scalping screen ahead of a 30- x 42-in. Pioneer jaw crusher. The scalper has rectangular openings of roughly 8 x 10 in. The primary crusher is set so that the drive shaft parallels the offbearing belt. This method of setting the primary is a little different from the more conventional pattern, for the stream of stone going into the crusher is at right angles to the long axis of the crusher's throat. Under the scalping screen is a 51/2-ft. Symons cone crusher; three-fourths of the production does not reach the jaw crusher.

A surge pile of modest size is provided, fed by the offbearing belt from the primary crusher and from the 5½-ft. cone crusher. Reclaiming from the pile is done by a heavy-duty Syntron electric vibrating feeder to a 36-in. conveyor belt.

The screening plant is quite simple

and consists of a tower structure with two 5- x 12-ft., three-deck wet, Ripl-Flo screens receiving a split feed from the surge pile. Below this pair of screens are two 4- x 12-ft. wet, double-deck Symons screens. The oversize is chuted to two Symons cone crushers, a 44-ft. and a 4-ft. shorthead unit. The throughs from each of the cone crushers fall to individual belts (one for each crusher) and the crushed material is returned to the 36-in. belt from the surge pile. Four sizes of stone are produced: 1½ in., ¾ in., and some 1 in. and ¼ in.

The finished and washed crushed

The finished and washed crushed aggregates fall to stacker belts that finger out over a 96-in. bolted steel plate reclaiming tunnel. Gravity gates feed this reclaiming belt; before the rock is loaded to cars it is given a final rinse on a 5- x 8-ft. vibrating double-deck Telsmith screen. The plant is located on the Charleston & Western Carolina railroad, but steel bins are also available for truck loading. The company built a two-mile long spur to serve the operation.

Water is supplied to the plant by four Ingersoll-Rand centrifugal pumps. A Hough rubber-tired end-loader is available for loading to trucks direct from the stockpiles. The plant has a capacity of 500 t.p.h.

The plant is of wood construction and appears to be laid out for high production with a minimum of equipment. Some of the equipment came from the aggregate processing plant that was a part of the Clark Hill dam construction work about 15 miles up



Right: Primary crusher set-up with scalper ahead of the 30- x 42-in. jaw crusher. Above: One of three shovels loading to a rear-dump truck in the pit; as much as 35 ft. of overburden has to be stripped in some greas.

the Savannah river from this quarry. (See the July, 1949 issue of ROCK PRODUCTS, page 56, for a detailed description of that operation.)

The office of Superior Stone Co. is in Raleigh, N.C. The company has many crushed stone operations throughout the Southeast.

W. T. Ragland is president of the company and R. B. Shepard is vicepresident. L. B. Shuping is secretarytreasurer. At Augusta, R. Y. Shuping



is superintendent. Other Augusta personnel are Dan Blake and John Bratton, engineers; Broadus Rogers, primary plant foreman; Sam Winchester, secondary plant foreman; Ed Jones,

load-out foreman; K. M. Eishenhaur, maintenance foreman; H. M. Handy, quarry superintendent; J. A. Fournier, office manager; and H. S. Miller, engineer.

# Slag Production

IRON BLAST-FURNACE SLAG production in 1951 totaled 29,327,434 short tons, valued at \$36,307,693, which was an all-time record output. These statistics were compiled by the National Slag Association in cooperation with the Bureau of Mines. Included are the outputs of 43 companies operating 68 plants expanding slag. Fourteen companies reported production of granulated slag.

Screened air-cooled slag, the major production, set a new record of 23,-276,692 short tons, valued at \$29,531,-983, which represented increases of 16 and 21 percent, respectively, over 1950 production. Of this production, 91 percent was used as railroad ballast, as aggregate in portland cement concrete, in various bituminous construction and for miscellaneous highway construction uses. Other uses were in the manufacture of concrete block, mineral wool and built-up roofing and roofing granules.

Marked increases were also reported for un-screened air-cooled siag production which totaled 1,732,969 short tons, valued at \$969,975, gains of 72 and 52 percent, respectively, over 1950 figures. Approximately half of this production was used in highway and airport construction.

Granulated slag, totaling 2,249,281 short tons, showed a 4 percent increase over 1950 records. Of this material, approximately 53 percent was utilized as a raw material in the

manufacture of hydraulic cement; 34 percent was used as road fill; and 7 percent was used in concrete block.

Ohio, as in several years past, was the largest producer of air cooled slag. Other principal producing states were Pennsylvania, Alabama and Illinois. Fifty-one percent of the total slag production was moved by truck; 47 percent by railway; and 2 percent by waterway.

A total of 2100 plant and yard personnel worked approximately 5,369,000 man-hours in the production of processed slag during 1951, as compared with 2015 employes working 5,399,500 man-hours in 1950.

#### Reclassification of Stock

STOCKHOLDERS of North American Cement Corp., New York, N.Y., recently approved an amendment to the company charter, reclassifying its stock. The exchange basis under the amendment is 1½ shares of new Class A stock for each share of Series A convertible prior preference stock; 1½ shares of Class B common stock for each share of Series B convertible prior preference stock; and one share of Class A common stock for each previously outstanding share of that class. The par value of the new shares was increased from \$1 to \$10 a share.

The board of directors took action for the redemption of all outstanding preferred stock and declared a 50 percent stock dividend on the reclassified stock.

# Age-Strength Relationships

AN ANALYSIS OF STRENGTH DATA from 13 different research projects, conducted at the research laboratory supported jointly by the National Sand and Gravel Association and the National Ready Mixed Concrete Association at the University of Maryland, showed that no single formula could be used to provide a dependable method of determining the strength development of 28-day concrete in relationship to 7-day strength, as recently reported in Highway Research Abstracts. It was found, however, that despite the variability of relationships between 7- and 28-day strengths, formulas could be used to establish expected strength developments within reasonable limits.

Tests proved that the formula giving minimum expected strength was

 $S_{28}=S_7+15\sqrt{S_7}$  (1) and the formula giving maximum expected strength was

 $S_{\pm} = S_7 + 40 \sqrt{S_7}$  (2) which indicates that a concrete producing a strength of 1600 p.s.i. at seven days may be expected to develop at least 2200 p.s.i. at 28 days, but not more than 3200 p.s.i.

The formula found to give most accurate results for the average case was:  $S_s = S_s + 25 \sqrt{S_s}$  (3) which, on the average, indicates that a concrete developing 1600 p.s.i. at seven days would be expected to produce about 2600 p.s.i. at 28 days.



Ship being loaded with phosphate at Nauru Island. The two arms of the belt conveyor cantilever leading plant extend over the holds of the ship and phosphate can be loaded at the rate of 1500 t.p.h. The ships generally used haul about 10,000 tons and can be loaded in one day

Two islands supply Australia and New Zealand with more than 1,000,000 tons of phosphate per year

By FRANCIS J. KNIGHT

# PHOSPHATE RESOURCES IN THE PACIFIC

THE STORY OF Ocean and Nauru isof the curiosities of history. Just over 150 years ago, a British ship cruising in the Pacific spotted the two tiny islands, one twelve and the other six miles in circumference, lying within one degree of the equator. The landing parties sent out were disappointed to find rock and rubble with nothing whatever of any apparent value to be seen.

The larger island was named Nauru and its smaller sister Ocean Island. The British authorities thought so little of the two little islands that they did not bother to make official claim to them by right of discovery.

Although Nauru was eventually annexed by Germany in 1888, the Germans were ignorant of its phosphate riches and nobody bothered about little Ocean Island at all. Apart from a very rare visit from a passing whaler, no visitors came to disturb the peace and poverty of the few native inhabitants.

Then in 1900 a curious chance put these rocky islets in the news and sent geologists scurrying across the Pacific. During the 1890's Australian and New Zealand agriculture had slipped rapidly towards ruin. Wheat yields dropped below productive levels and stayed there. The trouble was finally diagnosed as complete exhaustion of the phosphate content of the

Then followed one tremendous rush for superphosphate as the farmers recognized that here was the cure for their impoverished land. But available supplies were hopelessly insufficient to keep pace with the enormous demand. The phosphate came from deposits in various Pacific islands which were pretty well worked out. Although a great deal of prospecting was undertaken, new worth-while deposits were hard to find.

In the Sydney laboratories of the

Pacific Islands Co., the principal phosphate and guano importer of Australia, dozens of samples sent in by the prospecting teams were analyzed, including a high phosphate content rock from Nauru Island.

It was known that Ocean Island was of similar formation to the German controlled Nauru and a fast vessel was at once sent for samples. They proved to have the highest grade of phosphate content ever known.

The British Government gave the Pacific Island Co. authority to raise the Union Jack on Ocean Island as a sign of formal annexation, and granted it sole mineral rights. An extensive survey showed that practically the whole land area was one huge phosphate deposit extending in places to a depth of 50 ft.

Australia's phosphate problem was solved overnight.

The company then negotiated with the German company holding mineral rights on Nauru, to work phosphate on a royalty basis. The Germans, incidentally, were still entirely un-aware of the treasure contained in their rocky possession. The royalty arrangement lasted until the outbreak of war in 1914, when the Australian Expeditionary Force took over the island. In 1919 administration was taken over jointly by Britain, Australia and New Zealand under a League of Nations mandate.

In the early days, the phosphate was quarried by pick and shovel. The rock was loaded into flat-bottomed boats and transferred to the holds of seagoing vessels by basket.

Since the British Phosphate Commission took over from the Pacific Island Co. in 1920, extensive mechanization has been carried out. Power shovels are now in general use and electric cableways have replaced the long files of basket-carrying islanders. A small circular railway carries the rock to a central processing plant;

here it is crushed and dried before being delivered to the main storage bins to await transfer to ships for the journey to Australia, New Zealand or Britain.

The biggest problem that faced the commission was the provision of satisfactory ship loading facilities. Both Nauru and Ocean Islands are surrounded by jagged coral reefs that would rip the bottom out of any ship venturing close inshore. The phosphate vessels have to be made fast to deep-sea moorings laid in 200 fathoms of water.

Some of the fastest ship loading in the world is done at Nauru. Ships are brought in under a belt conveyor. cantilever loading plant installed in 1930. The two arms of the cantilever extend over the holds and phosphate can be loaded by this at the rate of 1500 tons per hour. The largest vessels normally engaged on the phosphate hauls carry 10,000 tons and thus can be fully loaded in one day.

A similar direct loading plant is planned for Ocean Island but has not yet been installed. Meanwhile, loading is done by lighters carrying the phosphate in steel tubs. It takes three to four days to load a full cargo.

Soon after Pearl Harbor, Japanese forces occupied both islands but were unable to make any use of the island's phosphate as the whole plant had been completely destroyed by the British Phosphate Commission staff before departure.

The biggest postwar tasks have been the repair of the railway, the cantilever loader, powerhouse and drying plant. Work has gone forward at top speed and the opportunity has been taken to increase the capacity of the cantilever loader from 1000 to 1500 t.p.h., and to mechanize the plant further. Recovery is now practically complete and output is now a little over the prewar figure of 1,200,-000 tons a year.

# INDUSTRIAL SAND PRODUCERS DISCUSS INDUSTRY PROBLEMS

Seventeenth annual meeting of N.I.S.A. emphasizes government regulations, employer-employe relations and technical discussion

MORE THAN 100 PRODUCERS and their wives, the largest number in history, attended the 17th annual meeting of the National Industrial Sand Association, May 15-17, at The Homestead, Hot Springs, Va. The meeting followed the pattern of informality, with a maximum of floor discussion and covered all the more important current problems facing the industry. Emphasis was on traffic problems, industrial health, percentage depletion, production and specifications, employer-employe relations, price and wage and salary controls and the meeting concluded with an off-the-cuff appraisal of the Washington scene by executive secretary V. P. Ahearn.

#### Officers

C. M. Hardy, Hardy Sand Co., Evansville, Ind., was elected president to succeed Sterling N. Farmer, who, with Mrs. Farmer, was paid a fine standing tribute by the membership for inspirational leadership through the past two years. Clarence R. Wolf, New Jersey Silica Sand Co., Millville, N.J., was elected vice-president and Emery M. Durstine, The Keener Sand and Clay Co., Columbus, Ohio, was elected treasurer.

Newly elected members of the board of directors are William J. Cannon, The Nugent Sand Co., Muskegon, Mich.; P. G. Forman, Industrial Silica Corp., Youngstown, Ohio; G. M. Mason, Clayton Silica Co., Waterloo, Iowa; and Marcus S. Wright, Jr., South River Sand Co., Old Bridge, N.J. Earl T. Andrews and P. W. Palmer continue on the board of directors and, in compliance with the constitutional provision limiting membership to two years, Russell G. Cronenweth, Lyle T. Manley and Jesse T. Morie retired from the board. Past presidents A. Y. Gregory, George A. Thornton and Sterling N. Farmer are ex-officio members. The 1952 fall meeting is to be held in Bermuda, October 20-25.

This past year was one of great accomplishment for the association and president Farmer, in his opening remarks, paid tribute to the members and legal counsel for their accomplishments. Among them were Emery Durstine and attorney W. W. Collin, Jr. for their work on traffic matters, the law firm of Covington and Burling and counsel John T. Sapienza for their contribution to obtaining percentage depletion benefits for the industry, and association counsel Theodore C. Waters for his accomplishments in the field of workmen's compensation and industrial health. On the subject of percentage depletion granted the industry (5 percent), Mr. Farmer was high in his praise of J. Rutledge Hill, who heads the tax committee of the National Sand and Gravel Association and who spearheaded the case for both the sand and gravel and the industrial sand industries which led to successful conclusion. Mr. Ahearn's many accomplishments also came in for praise as did the work of others on his staff in Washington.

Following Mr. Farmer's remarks, Mr. Ahearn commented on the fine attendance and gave credit to assistant secretary Kenneth Tobin and Mrs. Himmler, assistant to the treasurer, for their excellent work and particularly in preparing special reports. He cautioned that the industry must be prepared to defend its percentage depletion benefits, probably every year, lest those in Congress who object to the principle be successful in having the benefits erased. It is up to the industry, he said, to show that the public interest is served by percentage depletion.

The traffic situation was reviewed by association counsel W. W. Collin, Jr. who particularly covered the closed car complaint by the industry. The industry was successful, in the



New president C. M. Hardy, seated left, and executive secretary V. P. Ahearn, standing right, photographed with N.I.S.A. past presidents. Standing, left to right, are retiring president Starling Farmer, A. Y. Gregory and George A. Thornton. Seated next to Mr. Hardy are A. Warsaw and J. M. Strouss





Left: Norman H. Crissey, left, Wedron Silica Co., Chicago, Ill., with C. F. Devine, Silica Sand Traffic Association of Illinois, Chicago, Ill. Right:
Grant Forman, Industrial Silica Corp., Youngstown, Ohio, with J. M. Strouss, Deckers Creek Sand Co., Morgantown, W. Va.

bonded sand case, in obtaining a reduction in rates for open car shipments for long hauls, removing a discriminatory rate as compared to those for other classes of sand. In the closed car case, now pending, the issue is to remove an excess rate charged for closed car shipments as compared to open-top shipments and to obtain the same rate regardless of the type of car used. The complaint was filed two years ago and no decision has yet been handed down.

In commenting on ex parte 175, granting the latest general freight increase, Mr. Collin brought out how the level of taxes is now so high that the railroads must seriously penalize the shipper by charging far more than the amount they claim as necessary for profitable operation, in order to retain the required amount. It amounts to hundreds of millions of dollars that must be collected, in higher rates, just to pay taxes.

As far as the 3 percent transportation tax is concerned, covering equipment for hire, he expects that tax to continue as long as we have a national budgetary problem. On the general subject of freight rates, the interest of the industry, as he expressed it, is to aid the consumers of industrial sand whenever possible.

#### Car Supply

The subject of availability and condition of railroad cars was discussed, with comments from producers in various sections of the country. C. F. Devine of the Silica Sand Traffic Association of Illinois, speaking for the Chicago, Ottawa, Michigan and Wisconsin district, said that the big problem is in shortage of good flat bottom gondola cars. The railroads are complaining of considerable car

damage from clamshells operated by receivers. It is anticipated that demands by the cement industry for more covered hoppers will increase and likely soon present a problem. The supply of cars has improved, generally, he said, because volume of business has declined. Good class-A box cars continue hard to get and, it is feared, the railroads might slow building of cars.

Jesse T. Morie, Mauricetown, N.J., reported it is difficult to get good cars and practically impossible to secure clean ones. He finds it necessary usually to accept dirty cars. New Jersey producers are keeping a record of the expenses involved in cleaning and repairing cars. J. M. Strouss, Morgantown, W. Va., said that it costs his company about \$750 per month to clean and repair cars. The average is more than \$10 per car.

Sterling N. Farmer, Cleveland, Ohio, said that he turns down dirty cars and that other companies are doing likewise. An Illinois producer told of difficulties due to contamination with grain which would lodge inside the car lining and therefore be difficult to remove in cleaning the car. Another producer said that it was his company's practice not to load industrial sand into cars that have been hauling lime or grain. This problem of contamination is considered serious particularly in view of a developing buyer's market when every effort should be directed to maintaining customer good will.

Another eastern producer, with plants in New York and New Jersey, reported sufficient cars but of low quality. Welded cars were mentioned as satisfactory, with the hope that new cars would be of the welded type. One producer reported that he sometimes found it necessary to sand blast in covered cars. It was mentioned as good practice to let the railroads know that cost records for cleaning and repairing cars are being kept.

The emphasis given to speeding up turn-around time has been effective in increasing the availability of covered hopper cars by some 35 percent, according to one producer. The prediction is that the box car situation will become serious.

#### **Wage and Price Controls**

Executive secretary V. P. Ahearn covered the subject of wage and salary controls as well as price restrictions. He said that a company cannot increase wages by more than 10 percent over the January 15, 1950, rate and, under the cost of living provisions, by more than 4.8 percent over the January 15, 1951, rate. Increases up to those limitations may be taken legally. In the case of salaried employes, no cost of living adjustment is permissible.

Plans to improve vacations, provide health and welfare plans or for premium rates covering Saturday work, paid holidays, etc., can be worked out, but through application to the Wage Stabilization Board. No changes to the law are anticipated. Mr. Ahearn told how many industries are working out welfare programs for their employes and mentioned the plan inaugurated by the National Ready Mixed Concrete Association which will give the small employer the benefit of lower insurance rates. This is a voluntary program under the sponsorship of the association. The trend in labor relations is toward more employe benefits, he said, to provide more security and as a means to stabilize the working force. It was

suggested that the association give thought to a program similar to that of the ready-mixed concrete industry.

On the subject of price controls, it was brought out that the industrial sand industry is still governed by the General Ceiling Price regulation which stipulates that prices charged not be higher than charged for the base period, December 19, 1950, to January 25, 1951, covering the same commodity to the same class of purchasers. Highest price means that actually charged to a customer but, if no sales were made during the base period, the highest price quoted would govern.

The "same class" was interpreted to mean prices charged to dealers, to foundries, to glass companies, ceramic industries and other such classifications. However if, for example, a certain price was charged to a number of foundries and a different price to an individual foundry, as regular practice, that one foundry would be considered as a purchaser of a separate class, for purpose of complying with the regulation.

There is no basis, at present, for hardship relief except through the Capehart amendment, which is difficult to understand or even read and which has not yet been tried in the industry.

The future of price controls is uncertain, Mr. Ahearn said, and he guessed that March 1, 1953, might be the limit of extension. In answer

to a question, it was brought out that if a producer sells on a delivered price basis, he must absorb increased transportation costs. He hoped that it might be worked out that such increased costs might yet entitle a producer to increase prices. The Price Control Law comes into conflict with the Robinson-Patman Act, in cases like where practice has been to charge a different price to a single company in a class of purchasers, and the question then becomes which of the two laws would be violated when in compliance with the other. Mr. Ahearn concluded by offering to send out information for guidance in establishing a price for a new product.

## Production-Specifications

Stanton Walker conducted an informal discussion on production, specifications and uses of industrial sands. Mr. Walker threw out for discussion the question of whether or not the association might sponsor an organized research program that might undertake study of grading, methods of measuring gradation, test methods and other subjects on which more information is needed. After discussion, it was moved that a committee on research be appointed to report on the subject at the fall meeting.

The bagging machine problem, which has been considered at the last several meetings, came up again for discussion. The industry continues to

seek improved machinery for packing silica flour that would be subject to less wear and minimize dust leakage and spillage. Arnold Tanzer, New York City, reported on experience with a conventional packing machine as fitted with high tensile steel wearresisting parts. The wearing parts on this machine have stood up well but, when worn, there remained a problem of dust leakage and spillage. He believes a change in design of packing equipment is required. P. W. Palmer discussed a machine that he has built and which will be developed further with the Coddington Manufacturing Co. It is a four-tube machine, accurate, and one that Mr. Palmer believes will fill the needs of the indus-

Mr. Walker concluded discussion by suggesting possible new uses of industrial sand. Among them are the use of silica flour as an admixture in the manufacture of concrete products and its use as a pozzolan.

# Industrial Health

Theodore C. Waters, association counsel, in his paper "Report Upon Matters Relating to Employe Health," summarized recent developments in the field of industrial medicine. His discussion covered (1) legislative developments in workmen's compensation in 1952, (2) federal legislation dealing with industrial safety, (3) partial disability compensation for silicosis, (4) the symposium on pneu-





The golfers were all friendly before teeing off. Left: One foursome consisted of (I. to r.) John Putnam, Oregon, III.; N. C. Bos, Chicago, III.; George W. Cannon, Jr., Muskegon, Mich.; and W. H. Woodward. Right: Standing, I. to r., are Stanton Walker, Washington, D.C.; Marcus Wright, South River, N.J.; P. W. Palmer, Brownton, Wis.; J. M. Strouss, Morgantown, W. Va; and association counsel T. C. Waters. Kneeling, I. to r., are Jesse T. Morie, Mauricetown, N.J., and Edward Show, Millville, N.J.

moconioses to be sponsored by the Saranac Laboratory and (5) insurance rates.

As of the end of 1951, 43 states had enacted occupational disease compensation statutes but the year 1952 has been an off-year for legislation. An important item has been an amend-ment to the Workmen's Compensation Law of Virginia which substituted general coverage legislation for schedule of compensable diseases. Until the amendment, an employer had the option to assume liability under either plan. This action, said Mr. Waters, is in line with recent trends and serves as a warning to industry in other states as to legislative attempts next year to delete the schedule system of compensation and provide general coverage.

He touched upon the recent outbreak of silicosis claims in the foundry industry in Michigan which subjected some industries to the cancellation of insurance policies and later imposition of higher rates. As a result, a legislative attempt was made in 1952 to apportion among previous employers and insurance carriers any risk that might be imposed by the law for silicosis benefits but, fortunately, the bill was killed. This outbreak of silicosis claims has subsided and the situation has proved far less serious than it seemed at first.

In New York, a bill was introduced that would have deleted from the compensation statute the provisions denying payment of compensation for partial disability from pneumoconioses but the legislation failed of enactment.

In West Virginia, the State Board of Health adopted Chapter 6, Article 2. entitled "Occupational and Industrial Health Regulations," effective July 1, 1952. Of importance to West Virginia producers, these regulations follow the general plan of the recommended code of industrial hygienists prepared by the American Conference of Industrial Hygienists and the regulations cover the control of atmospheric contaminants, illumination, ventilation, housekeeping and sanitation. Senate Bill No. 2325 (Senator Humphrey) and Senate Bill No. 2714 (Senator Murray) were discussed. The Humphrey bill would create in the Department of Labor a Bureau of Accident Prevention to investigate industries related to interstate and foreign commerce, to develop safety standards and promote their accept ance by affected employers and employes. This bill would set up federal enforcement authorities.

The Murray bill would authorize federal grants-in-nid to state labor agencies and would strengthen state labor agencies. This bill has been considered by Senate committees for some years. Mr. Waters said that neither bill has any chance of enactment in this Congress but the importance of the legislation is the fur-

ther attempted invasion of states' rights and responsibilities by federal agencies.

Whereas in many states, statutes providing compensation for silicosis deny compensation for partial disability, the amendment to the New Jersey law that became effective a year ago makes partial disability compensable. The important question is the establishment of some method for the proper evaluation of partial disability from pneumoconioses. Standards are being developed in an attempt to remove guesswork.

Mr. Waters has been invited to participate in a symposium on pneumoconioses to be sponsored by the Saranac Laboratory the week of September 22, 1952. It is expected that developments from this meeting will



New officers of N.I.S.A. Left to right are Emery Durstine, treasurer; C. M. Hardy, president; and Clarence Wolf, vice-president

carry considerable weight with legislatures and compensation commissions and Mr. Waters will report further on the symposium at the fall meeting of the association.

The trend of compensation insurance rates, which had been gradually downward for the past ten years, has reversed as of the first of 1952 and there will be substantial increases July 1 of this year and further increases next year. As to rates applicable to silicosis, beginning this year the rate applicable for silicosis risks will be absorbed in the general workmen's compensation rate. Reasons for increased rates are due to increases in benefits, extension of coverage, unfavorable court decisions with respect to the statutes of limitation and a growing fear of industrial depression.

Following Mr. Water's paper, executive secretary V. P. Ahearn commented that there always exists an undercurrent of pressure against the use of materials classed as hazardous. In his remarks about the proposed bills for industrial safety, he said that if industry is indifferent with respect to silicosis there would be likelihood of enactment of a federal law. It is important to do what is necessary in order to keep out the federal government.

#### Percentage Depletion

Tax counsel John T. Sapienza reviewed the problem of percentage depletion. He told of the cooperative effort with the National Sand and Gravel Association and said that the industry will have 30 days to present objections after the long-awaited regulation is written and published in the Federal Register. He anticipated that the regulation covering percentage depletion will be ready in a few months and that final regulations would be in effect by March 15, 1953.

The draft of the regulation as being worked up, has no specification "ordinary treatment processes" and the statute reads that "gross income from the property" applies to extraction and the ordinary treatment processes to obtain the ordinary product. Processes of washing, screening, crushing and sizing will be recognized as ordinary treatment processes while pulverizing will not be recognized unless it is part of the ordinary treatment process. Mr. Sapienza hopes that the regulations will be made wide open so that individual cases may be presented.

The Bureau of Internal Revenue prefers to consider the cut-off point as early in the process as possible and consider processing beyond actual excavation as a manufacturing operation. Mention was made of the fact that the courts disagreed with the Internal Revenue Bureau in a case involving the talc industry and ruled that it was normal practice to pulverize talc to make it marketable. The question is one of what the first marketable products from an operation are. The bureau wants to consider this as the first stage after excavation where the product can be sold, even if the product not be sold.

Insofar as the limestone industry is concerned, where there are provisions for either 5, 10, or 15 percent depletion for which a producer might qualify, Mr. Sapienza said that there will be much controversy. The question will be whether end use or chemical composition will govern in determining what percent depletion will be permitted.

In order to qualify for percentage depletion benefits, he stressed the importance of having the requisite economic interest in the property involved. If the producer owns or leases the property, he will meet the requirements but, if he only has an oral agreement on the property involved or non-exclusive rights to it, advice is to consult an attorney. Getting a lease would have the effect of at least qualifying a producer for consideration of percentage depletion. If a property is sold but rights to the sand are reserved, opinion is that the producer is qualified for percentage depletion. As far as the Renegotiation Act of 1951 is concerned, the language is so worded that Mr. Sa-







Three prominent members with their wives. Left to right: Mr. and Mrs. Sterling Farmer, Mr. and Mrs. N. C. Bos and Mr. and Mrs. W. J. Cannon

pienza believes producers are entitled to assume they are not subject to renegotiation.

A. Y. Gregory was appointed chairman of a new percentage depletion committee. Members of the committee are Earl T. Andrews, E. M. Durstine, Sterling N. Farmer, Charles G. Runkle and A. Warsaw.

#### **Washington Events**

In the concluding session, following a report to members on the semi-annual reports on wages, hours of work and conditions of employment and an informal discussion of employer-employe relations in the industry, executive secretary V. P. Ahearn reviewed the Washington scene. The ladies were invited to hear this informal talk, according to annual custom, and Mr. Ahearn's comments were received with great enthusiasm.

He covered the Newbold Morris case and many of the other recent incidents in Washington. According to his observations, Mr. Truman is unpredictable and believes, himself, that he has done a good job and been a great president. One big failing is that Mr. Truman, at press conferences, answers all questions off the cuff when no one could possibly come up with the right answers. He does not worry about any incorrect answers he might give out for he knows that memories of the public are short. He is a practical politician and believes that his party will again be voted into power this year.

The steel case came in for some comment by Mr. Ahearn. He said that Philip Murray is after a bargain with U.S. Steel Corp. and had no intention to engage in real collective bargaining. He believes that the steel industry made a mistake in allowing its case with the unions to get to Washington, where industry usually finds itself at a disadvantage. As he expressed it, a free economy is at stake in this dispute.

Mr. Ahearn believes that tripartite

boards are a menace and that boards set up to handle labor disputes should be only of people representing the public interest. He said that president Randall of Inland Steel Co. made a mistake in his statement that the public members on the committee were on the "payroll of the unions." His prediction that the Supreme Court would uphold Judge Pine's decision has since turned out to be correct. He further believes that W.S.B. recommended increases for the steel workers will be accepted, Philip Murray having been put in a position where he could not accept less because the government has gone on record that the figures were fair. Other predictions made were that the steel industry would lose face and that John L. Lewis will appear and set out to show up Mr. Murray, in bargaining for higher wages for his coal mine workers.

The people are not sufficiently concerned about the steel case, he said, but it would be much worse for the nation if the right to strike be prohibited. The danger is that, in event of another bad strike, Congress might write a quick law that would prove bad. One recommendation made was that employers must take steps to capture the loyalty of their employes.

Turning to politics, Mr. Ahearn said that Mr. Truman actually would be the strongest Democratic candidate if he should decide to run. The prediction was made that Governor Stevenson would be the Democratic candidate if Senator Taft be nominated by the Republicans. If General Eisenhower be nominated, Senator Kefauver would be left to oppose him on the Democratic side.

Mr. Ahearn believes that General Eisenhower will be nominated only if the Republicans think he is the only man who can be elected President. The choice is between Taft and Eisenhower, he said, but the chances of a Republican victory are diminishing as they fight for the nomination. It will take a terrific struggle in the nature

of a crusade for the Republicans to win the election, in his opinion, because Mr. Truman is powerful and has the power to capture the public imagination.

At the concluding session, Mr. Farmer read telegrams sent in behalf of the members to Mrs. E. O. Schneider and to J. S. Coxey, president of Industrial Silica Corp., Youngstown, Ohio. The wire to Mrs. Schneider was in tribute to E. O. Schneider, Ottawa Silica Co., Ottawa, Ill., who passed away since the last meeting. Mr. Coxey was unable to be present due to illness.

#### Entertainment

Entertainment features included a bridge—tea for the ladies, a picnic and golf tournaments for both the ladies and men.

# **Barge Terminal Planned**

Dewey Portland Cement Co., Kansas City, Mo., recently announced plans to build a barge terminal at Kansas City at a cost of more than \$1,000,000. The company is awaiting approval of the U.S. Corps of Engineers before starting construction.

## **Opens New Plant**

PUTNAM STONE Co. recently began operations at its new crushed stone plant near Ottawa, Ohio. Equipment includes crushers, elevator and eight storage bins. The plant is under the management of J. H. Shroyer, president, and son, Jim Shroyer,

# **Human Relations Study**

UNITED STATES GYPSUM Co.'s Jacksonville, Fla., plant recently completed a 15-week conference on "Human Relations in Supervision." The conference was designed to bring about better understanding and relations between supervisors and the men working with them. Similar conferences are being conducted at the company's 46 other plants.





Handling and havinge equipment used in the pit of Crystal Lake Crushed Stone Co. Left: A 4-cu. yd. truck being loaded by a 1-cu. yd. front-end loader. Right: A 6-cu. yd. pit havinge unit being loaded by a 34-cu. yd. shovel

# FLEXIBLE SMALL CRUSHED STONE PLANT

Crystal Lake Crushed Stone Co. produces various sized products through use of mobile loading equipment

CRYSTAL LAKE CRUSHED STONE Co.'s plant, operated continuously since 1918, is on top of a terminal morain deposit of sand and gravel at Crystal Lake, in east-central Wisconsin. Pitrun material is reclaimed from different parts of the deposits, depending upon desired end product, with a mobile fleet of recovery equipment. Plant capacity is 60 t.p.h.

Incorporated in the plant are a gyratory crusher and a hammermill, three vibrating screens and a revolving screen. Finished material is stockpiled from stacker belts, with recovery from stockpiles being handled by an end loader and a bucket loader. Sand is stockpiled over a reclaiming belt conveyor operating in a tunnel.

Principal recovery of pit-run material, at the present time, is from pit No. 2, with a pit face as high as

125 ft. in some places. Blasting is resorted to when the overhang becomes too great due to material being removed from the base. Recovery from the pit is accomplished by a %-cu. yd. Lorain diesel-powered shovel which loads to a 6-cu. yd. Koehring Dumptor. Alternate recovery method in this highly flexible operation is by a 1-cu, yd, end loader mounted on a T-9 International diesel-powered tractor, loading to 4-cu. yd. dump trucks. Pit-haulage equipment travels about 1/4 mile to the plant, where material is dumped to a 6-cu. yd. hopper that is covered by a bar grizzly with 5-in. spacing between the bars.

Material from the receiving hopper falls onto a Universal 4- x 6-ft. vibrating scalping screen carrying 1%-in. mesh. Oversize from this screen falls directly to a No. 8 Telsmith gyratory crusher, discharge from which, plus throughs from the scalping screen, are gathered in the boot of a bucket elevator on 50-ft. centers. Partially sized material from the elevator is discharged into a revolving screen that makes four gradation separations and carries 1½-, ¾-, and ¾-in. mesh on the three jackets. Minus ¾-in. material is chuted to a Simplicity single-deck vibrating screen that carries ½-in. mesh. Oversize from this screen is stockpiled as finished material and throughs are stockpiled separately as sand.

Plus %-in. minus 4-in. material from the revolving screen is stockpiled as finished material. Minus 1½-in. gravel is chuted to a Telsmith single-deck vibrating screen fitted with %-in. mesh. Oversize from this

Continued on page 98





Mobile equipment plays an important part in reclaiming and shipping the stone. Left: A 1-cu, yd. end loader loading a 22-ton semi-trailer from the stockpile. Right: Bucket loader reclaiming finished material from stockpile. Note the stacker belts in the background

# MERCHANDISING IDEAS HIGHLIGHT N.A.L.I. SUMMER MEETING

Chicago meeting also covered conservation appropriations, percentage depletion and functions of liming

SALES PROMOTION was the keynote of the mid-year meeting of the National Agricultural Limestone Institute, held June 3-4 at the Sheraton hotel in Chicago, Ill. One morning session was devoted specifically to this topic, but during most other sessions and in informal discussions merchandising invariably was brought up. The meeting wasn't one-sided, however, for reports brought out the status of ACP appropriations, percentage depletion and industry problems, and Emil Truog, chairman, Department of Soils, University of Wisconsin, discussed the basic reasons for liming from the soil technologist's viewpoint. Former Congressman George H. Christopher of Missouri was present to commend producers for their soil conservation efforts.

William E. Stone, Piqua Stone Products Div., Armco Steel Corp., Piqua, Ohio, who is chairman of the N.A.L.I. promotion committee, led the discussion on promotion. The committee's recommendations formulated during a March meeting were read and described by Mr. Stone. He first made a few remarks about the trend towards selling agstone as much from the conservation angle as on the product itself. More and more people have a knowledge of and interest in conservation, the Rotary and Kiwanis Clubs, for example, Mr. Stone pointed out. Thus conservation should always be kept in mind in advertising, though of course only honest advertising should be undertaken, the speaker emphasized. It will pay big dividends.

The health angle is also very important and should be emphasized. Mr. Stone commented that it is necessary to get over to people living off the land the fact that land must be conserved, that livestock and the people who eat the livestock cannot remain healthy if the land does not. Then too, it is necessary to convince businessmen of the need for continued farm prosperity.

The principal recommendation presented was that N.A.L.I. undertake a promotional program which will be of interest to the greatest number of members. Specific recommendations were also presented. New advertising leaflets for the promotional program



A scroll was presented to Philip E. Heim, right, Carbon Limestone Co., Lowellville, Ohio, in appreciation of his efforts leading to the merger of the two former associations into N.A.L.I. President Robert Patron made the presentation. A scroll was also given to Vincent H. Shea, Hoosac Valley Lime Co., Adams, Mass., as a similar token of appreciation, though he was unable to be present to receive it

this year were mentioned-one folder type, one "stuffer" for a No. 6 envelope and one "stuffer" for a No. 10 envelope. Since the farmer's reading habits have changed from the time he would read anything he could get hold of, to the present when he is flooded with advertising and news matter, the committee felt it is much more important to send out inexpensive literature frequently than it would be to send out expensive pieces occasionally. These envelope stuffers will be made available both with and without a company name imprint; they are printed on one side only (see cut) and are intended to be sent along with bills or other material that is being mailed anyway. The cost is going to be kept low, \$6 per thousand without company name, so that as many members as possible can take advantage of the material. It was suggested that members could obtain rubber stamps of the company name and address to use on the mailJ. B. Mount, Maymead Lime Co., Shouns, Tenn., asked if anyone thought it would be worth while to place an order form on the back of the envelope stuffers. The only advice forthcoming was from Robert M. Patton, Plum Run Stone Div., New York Coal Sales Co., Columbus, Ohio, and president of N.A.L.I. He mentioned his company's experience with a return reply postcard on which orders could be placed. The results were so disappointing the project was abandoned, he reported.

When it was disclosed that not enough interest had been shown in the use of newspaper mats and that the service would therefore be discontinued, a number of members present objected. If at least 100 orders for the same mat are received, the cost would be 15 cents each, so unless there is a sufficient number of orders the association cannot undertake this service, it was pointed out.

## Billboard Advertising

The Iowa Agricultural Limestone Association billboard campaign was described by Clint A. Allen, executive secretary of the Iowa association. Though radio and movie trailer advertising had been tried by the association, billboard advertising was chosen for the major effort because of the extremely low cost and because of the large audience reached. Space costs \$15-20 per month, though some locations are as low as \$11. The program is set up to run all year, each poster remaining in place for 60 days. At the rate of \$14 per poster (plus about \$2.50 additional for the company name) and a 60 day period per poster, the cost of this method of advertising is less than \$1 a day, Mr. Allen

Each year a new series of posters is prepared. The new series to be placed in service beginning November 1 was displayed by Mr. Allen. Each poster is keyed to a seasonal point, e.g., the November-December poster theme is "Let Us Spread Your Limestone." Since the posters are to be made available nationally to N.A.L.I. members, small black and white reproductions will be printed for distribution to enable members to make



Clint A. Allen, executive secretary of the lowa Agricultural Limestone Association, displaying samples of next year's series of billboard posters during the merchandising session

a choice of any posters they may want.

Mr. Allen brought up the case of a producer owning his own billboard. In that instance, he needs only to buy the posters (same rate), though he will have to pay for the posting himself. This has been running from \$5-7.50 for each poster, Mr. Allen said.

Mr. Stone mentioned smaller boards that truckers are urged to put up in his area. These are 30- x 48-in. masonite boards printed on both sides, though they have also been made up printed on one side only. The cost is \$75 for four boards printed on both sides. The trucker has to supply the two mounting posts for each board, and also must install them himself.

The next recommendation offered was that the monthly news service be continued because of the widespread acceptance by association members and by newspaper editors. A survey of editors showed that more than half of those queried wanted to continue receiving the news releases. It is planned to finance this service by charging members according to the number of newspapers they request that releases be sent. The committee recommended that the service be expanded to include radio stations and farm magazines. It was also recommended that tape recordings be made for use by radio stations. These could be used either by members on their own programs or by the stations without commercials. Robert M. Koch, executive secretary of N.A.L.I., commented that the association has a tape recorder with which 3-, 5- and 15-min. tapes could be recorded of such things as interviews with prominent men in agriculture, or of discussions, etc. The

tapes would cost about \$6 each, but could be circulated.

Development of some agstone films from current U.S. Department of Agriculture films was recommended. Since the association cannot afford one of such scale as "The Other Side of the Fence," it was suggested that attempts be made to interest an equipment manufacturer in financing one which would be adaptable to N.A.L.I. use.

The trophies which have been chosen as awards to "Green Pasture' contest winners were recommended by the committee for use by members in their own promotional programs. Mr. Koch said that in the past, prizes have been presented only to state winners and that nothing has been done for county winners. As an experiment, N.A.L.I. gave prizes (a cup for 1st place, medals for 2nd and 3rd place winners) to county winners in Massachusetts. These prizes will remain in the county agent's office during the year before presentation. The experiment was termed successful and was recommended to all members, not only for presentation to National Grasslands Program contest winners but also for winners in competitions held by 4-H clubs, Future Farmers of America, etc.

Some type of slogan was recommended for adoption by the association for use by members. Three suggestions were given:

Limestone-don't put it off-put it

Limestone doesn't cost—it pays. For the land's sake—use limestone.

#### Why Lime?

The featured speaker of the meeting, Emil Truog, stimulated much thought with his informative talk.

He confessed that he must have been destined for studies of limestone from 'way back, since Emil spelled backwards is "lime." Returning to the present, Mr. Truog said that he had just read in ROCK PRODUCTS that the nation's farmers should be spreading 80,000,000 tons of limestone a year instead of 30,000,000 tons, but that his calculations indicated that 500,000,000 to 1 billion tons are needed to lime all acreage initially. Maintenance requirements will then take 50,000,000-100,000,000 tons annually, in his opinion.

The functions of limestone spreading were listed by Mr. Truog:

1. To supply Ca and Mg (though altogether, 15 elements are required for plant growth).

To neutralize soil acidity-too acid soil is of course toxic to many plants.

3. To make and keep phosphorus more available. If limestone did nothing else but make phosphorus available, according to Mr. Truog, that would be enough to justify liming. At least ¼ to 9/10 of superphosphate fertilizers will be tied up in soil if it is acid. Making this available requires liming nearly to the neutral point. Evidence substantiating this fact is very conclusive, the speaker pointed out, having been obtained from radioactive phosphorus tracer experiments.

4. To promote nitrogen fixation. Leguminous plants-clover, alfalfa. peas, beans-have nodules of bacteria on their roots which take up gaseous nitrogen and "fix" it into a form plants can use. This symbiotic relationship by which bacteria supply the fixed nitrogen and the plant furnishes carbohydrates to the bacteria is invaluable to the farmer. Over every acre of land lies \$5,000,000 worth of nitrogen. A season's growth of alfalfa will make \$10-25 worth of fixed nitrogen per acre through the root bacteria. This will take place only in soil limed closely to the neutral point.

5. To promote nitrification. This involves making nitrates of materials in the soil, accomplished by different bacteria in the soil. This process requires soil at the neutral point, or at least not too acid.

6. To promote build-up of organic matter. This requires nitrogen—"nitrogen spells organic matter." This occurs by nitrogen fixation, which involves growing legumes, which in turn means a soil near the neutral point.

7. To improve physical condition of soils, done by building up organic matter.

8. To promote soil conservation, prevent erosion, run-off, etc.

9. To promote production of better feed and food. Man lives much on seeds, which are low in calcium, high in phosphorus. Animals live more on vegetative portions of plants, which are high in calcium, low in phosphorus. Milk, as an example, is high in calcium since cows eat alfalfa.

A series of lantern slides graphically demonstrated Mr. Truog's reasons for liming. The first slide showed alfalfa grown in sand cultures at different pH's. All cultures had the same amount of Ca and Mg, yet a pH between 7-8 gave the best results. This is a pretty good answer to those who regard the function of limestone only as furnishing these two elements, Mr. Truog contended. Though no culture was grown at pH 6.5. Mr. Truog felt pretty sure the alfalfa would be as tall as at pH 7. For this reason he emphasized that liming should be continued until at least a pH of 6.5 is reached.

There are two direct influences of high and low pH effect on soils. These are the toxic or destructive effects of H and OH ions on root tissue, and the unfavorable effect of low pH on the balance between the toxic and acidic soil constituents available for absorption by plants. In addition there are many indirect influences, such as the availability of nutrient elements and the activity of microorganisms.

The common sheep's sorrel is an indication of too high soil acidity. It grows best near pH 7, making it an effective indicator.

One slide showed the excellent growth on land in north central Wisconsin which was once very acid. Limestone was spread on test plots at the rate of 2, 4, 6, 8, 9 and 10 tons per acre, a 0-10-30 fertilizer at the rate of 1500-3000 lb. per acre. The maximum cost was about \$45 per acre, but following these applications there never was a crop failure. The

oat yield has been about 82 bu. per acre. The program proved so effective that Mr. Truog and his associates talked bankers into making loans to farmers to finance this soil improvement.

Mr. Truog stated that in his lifetime the U.S. population has increased 100,000,000 and that every day there are 75,000 more people to feed. The problem therefore is not going to be one of surpluses, but rather how to increase the yield of our farmlands. He feels that the present hay yield, 1% tons per acre in Wisconsin, can nearly be doubled, to 3 tons per acre. At present the average corn yield in Wisconsin is 45-50 bu. per acre, but Mr. Truog has figured out a program to yield 100 bu. per acre with the proper fertilizer, sun and rain conditions. If the nation's farmers use the amount of agstone and fertilizer they should, there is no reason why, in the speaker's opinion, they can't feed a larger population. Feed requirements may seem higher than necessary, but Mr. Truog pointed out that only 1/5 to 1/10 of the amount of calories put into animals comes out as usable food.

The question was asked how much calcium is lost in growing plants. Mr. Truog answered that every ton of produce removes 100 lb. Proper fertilizing and liming will practically eliminate any leaching out of calcium and any water run-off—the plants use all the water. Thus there is practically no leaching in Wisconsin. States south of it, with sandy soils, will lose some water by run-off, however.

#### A Farmer Looks at Liming

George H. Christopher, former U.S. Congressman from Missouri, brought out many facts about agriculture and liming that farmers in particular should know. In this era of headlinehogging events in atomic physics. chemistry and astronomy, soil study is often overlooked by many, considered by others unimportant in comparison. However, the study of soils is something that will benefit man very much, Mr. Christopher observed. He himself has had 4000 tons of limestone spread on his Bates county, Mo., farm as a result of tests made on his land.

The fact is, the speaker said, soil conservation is almost a religion with him, since a deed to land does not carry with it permission to destroy the fertility of that land. Unless it is possible to educate the farmer to take measures to preserve his land, Mr. Christopher felt that laws and regulations may become necessary to force it.

The Department of Agriculture has asked for a 10 percent increase in all food and fiber production. The speaker said he felt farmers can do this, but that the future may be less certain since the increase will undoubtedly be requested every year



One of the envelope stuffers N.A.L.I. is making available to members at a nominal price as part of an aggressive promotional campaign

from now on to feed the country. By 1975, for instance, we will have to have as much more beef as is now being produced in Texas, Oklahoma and Minnesota, as many more hogs as are now produced in Nebraska and Iowa, or as many more sheep as are now produced in Nevada, Wyoming, Utah, and Montana. Production increases of these magnitudes will just be sufficient to keep per capita consumption at the same level as at present. An agricultural miracle is being performed now, but it will have to be increased in the future.

# **Blasting Legislation**

Jules Jenkins, Vibration Measurement Engineers, Chicago, Ill., posted the group on some of the restrictive legislation against blasting now gain-



Two gentlemen from Pennsylvania: left to right are Rabert Reish, Whiterack Quarries, Bellefonte, and Leonard S. Fry, Fry Coal & Stone Co., Mercersburg

ing a foothold, particularly in New Jersey. Formerly 90 percent of the sensible limit of ground blasting wave (by Bureau of Mines formula) was the maximum permitted, but now it is becoming the case that if anyone can feel the blast wave, the explosion is too great. If the New Jersey law were applied in Illinois, Mr. Jenkins gave by way of illustration, 95 percent of producers would be out of business.

#### **Percentage Depletion**

More about percentage depletion came up for discussion. In the absence of Horace Krause, chairman of the N.A.L.I. percentage depletion committee, Robert M. Koch, executive secretary, gave a run-down of late developments. Since the law didn't clarify the amount of percentage depletion to be taken, many producers still don't know whether to take 5, 10, or 15 percent. All limestone producers are permitted at least 5 percent allowance, dolomite at least 10

percent. The N.A.L.I. committee has recommended taking the full 15 percent (permitted producers of chemical or metallurgical grade limestone) in order to make a strong case and to set a precedent for the future whenever the law is clarified. Briefs have been filed with the Bureau of Internal Revenue asking for that amount of depletion allowance.

Mr. Koch said he believes that all limestone regardless of use will eventually be given 15 percent, with one reservation—that the limestone be of a grade usable for agstone, i.e., chemical grade. Though Mr. Koch expects an adverse decision by the BIR, he commented the chances for the courts to reverse any such decision are excellent.

There are two ways to file a tax return. One is to file for the full 15 percent allowance. The other way, if a producer feels his case is not very strong, is to file for 5 percent and attach a statement to the effect that the producer feels he is entitled to 15 percent. If the law is clarified granting this amount, the tax overpayment will be returned with 6 percent interest.

The fiscal year in which depletion benefits may be figured is very clearly defined in the law—after December 1, 1950. There is a possibility that the law will be amended to allow benefits after January 1, 1951, regardless of the producer's fiscal year period. Other national associations are also working to achieve this goal.

The BIR insists on allocation of profits to the trucking operation if the producer owns his trucks. Some producers are setting up dummy trucking firms to prevent spreading the profit over all operations, thus enabling them to take advantage of the full 50 percent of net income as the depletion allowance. National Agricultural Limestone Institute's Membership Letter No. 5 dated February 28, 1952, clearly explained these and other aspects of the percentage depletion law.

### Reports of Officers

President Patton discussed the membership drive. Five regions, with a vice-president over each, have been set up. The regional vice-president and his appointed membership drive chairman are charged with obtaining new members. One activity recently begun is circularizing producers to join. Since the January convention of the association, 193 members have joined; 163 had belonged to either of the former organizations, and 30 were new members. There are more than 810 producers who are not members of N.A.L.I., though the association, Mr. Patton is certain, represents the bulk of the tonnage of the industry.

The board of directors, President Patton reported, has decided the locations for the next two annual conventions. The 1953 convention will be held in Washington and the 1954 meeting will be held in Chicago in conjunction with the National Crushed Stone Association machinery exhibition. In other business the board of directors amended the by-laws to permit no fewer than 20 nor more than 60 directors on the board after 1952. A formula was devised to determine how many directors are to be elected from each region. One-third are to be elected each year, providing a complete change every three years.

A request was made by Mr. Patton for N.A.L.I.'s participation in a radioactive calcium experiment to be conducted at the University of Tennessee. This would trace the passage of calcium through the soil into plants. This experiment will require \$1200 in donations from association members. Other contributions were requested to be made to continue the National Grasslands Program. If N.A.L.I. is unable to raise \$500 by individual contributions, the association will have to make up the difference from the operating fund, according to Mr. Patton.

The finance committee report, given by chairman Clarence Munz, Eastern Rock Products, Inc., Utica, N.Y., brought with it a problem of procedure. The recommendation for raising dues to finance an increased budget was referred to the entire board of directors, to be accomplished by a mail ballot. The results will then be given to the general membership.

The board of directors sent a note to Mrs. Henry Huschke, on behalf of all N.A.L.I. members expressing the great loss all have felt with the passing of Mr. Huschke.

## **Conservation Program**

Executive secretary Robert Koch reported the status of the Agricultural Conservation Program's \$250,000,000 appropriation bill. Since the meeting the bill has come up for a vote in the Senate\*. Turning to other matters, Mr. Koch said that one question persistently comes to his office—soil tests in many states. Some agronomists question the value of a pH test to determine need for agstone. State P.M.A. offices put in such regulations (only two states make the pH test mandatory before limestone can be spread); this test is not required by the Washington P.M.A. headquarters.

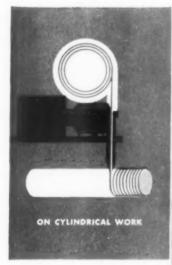
#### Social Affairs

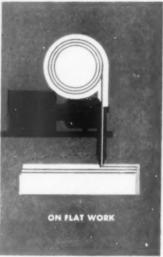
Following a reception and dinner, President Patton presented a scroll to Philip E. Heim, Carbon Limestone Co., Lowellville, Ohio, as a tribute to Mr. Heim's efforts in merging the two former associations into the

(Continued on page 98)

<sup>\*</sup>The Senate passed the appropriations bill by a vote of 35 to 23 on June 6, authorizing \$250,000,000 for the 1953 ACP.

# For automatic welding... STOODY 104





# A New Tubular Fabricated Build-up Wire

Stoody 104 was specifically developed to supply properties lacking in high carbon weldments—exceptional strength, ductility, resistance to abrasion and deformation. Designed also as a final overlay for certain types of equipment such as tractor track rails, sheaves, mine car wheels, etc.

Stoody 104 bonds readily to all weldable SAE and AISI steels, forms an ideal underlay for hard-facing alloys. Deposits are readily machinable and respond to heat treatment.

Ask for fully descriptive folder from your Stoody dealer . . . listed in the telephone directory "yellow pages" . . . or write to

## STOODY COMPANY

11929 E. SLAUSON AVENUE, WHITTIER, CALIFORNIA

# EXPANDED SHALE PRODUCERS FORM NATIONAL ORGANIZATION

THE LARGEST GROUP of expanded shale manufacturers to assemble at one place met in St. Louis, Mo., May 5-6, to found a nationwide organization to be known as the Expanded Shale Institute. S. Carl Smithwick, president of Smithwick Concrete Products, Portland, Ore., was elected first president of the institute, and the following officers were elected to the balance of the executive committee: W. W. Allen, Hydraulic-Press Brick Co., St. Louis, Mo., first vice-president; Alex R. McVoy, Texas Industries, Inc., Dallas, Texas, second vice-president; J. Murray Black, John





Left: Alex R. McVoy, second vice-president of newly formed Expanded Shale Institute. Right: S. Carl Smithwick, president of expanded shale producers' group

H. Black Co., Buffalo, N.Y., secretary; and A. R. Waters, Carter-Waters Corp., Kansas City, Mo., treasurer.

Twelve states and Canada were represented by top officials of nearly all the principal expanded shale plants using the rotary kiln process. The companies represented were the Featherlite Corp. and Texas Industries, Inc., Dallas, Texas; the Mc-Near Co., San Rafael, Calif.; Kentucky Lightweight Aggregates, Inc., Louisville, Ky.; Poston Brick & Concrete Products, Springfield, Ill.; Southern Lightweight Aggregates Corp., Richmond, Va.; Smithwick Concrete Products, Portland, Ore.; John H. Black Co., Buffalo, N.Y.; Carter-Waters Corp., Kansas City, Mo.; Buildex, Inc., Ottawa, Kan.; Sunnyhill Aggregates Corp., New Lexington, Ohio; Lake City Lightweight Aggregate Corp., Lake City, Tenn.; Hydraulic-Press Brick Co., St. Louis, Mo., and The Cooksville Co., Ltd., Toronto, Canada.

Each member company will be represented on the board of directors by an official to be designated by the company. Board members have yet to be chosen. National headquarters of the institute will probably be in Chicago.

The impact on the construction industry by expanded shale in the last ten years, as a result of its light weight, great strength, and waterproof, thermal, acoustical and refractory qualities, has been so great that architects and engineers are calling for more information than can be supplied adequately by a single manufacturer. The scope of the institute's work will include correlation of research and experimental work already accomplished or underway by other agencies as well as original research; educational and promotional work with architects, engineers, universities and the general public, and dissemination of technical and general information to the entire construction industry.

Expanded shale, because of its inherent physical properties and characteristics, is one of the most versatile aggregates in the construction industry. Due to one or more of its properties it is coming into more widespread use. Indication of this is shown by the great variety of uses of the material, including lightweight concrete masonry units; tilt-up wall panels; multiple-story buildings; precast roof and floor slabs; piers and superstructures of bridges; bridge decks; precast bridge members, culverts and guard rail posts; ships and barges; prestressed and poststressed concrete; jet plane runways and aprons; refractory purposes; roofing tile, laundry trays and burial vaults; loose insulating fill; plant culture; plaster and stucco aggregate

About ten years ago, when expanded shale aggregate had been known to the construction industry for 25





Left: J. Murray Black, secretary of institute. Right: A. R. Waters, treasurer

years, several new uses were developed which brought added incentive for manufacture. Bridge engineers began to value the lightweight, extrastrong concrete having high insulation value produced by expanded shale. Today they are specifying it for bridge decks and superstructures.

Airfield engineers faced with producing aprons and runways capable of withstanding the terrific heat blasts from jet engines are turning to light-weight aggregate concrete. New tilt-up methods of building construction make use of the light weight and thermal qualities of lightweight ag-

The concrete products industry, faced as it is with diminishing supplies of cinders and other lightweight aggregates, promises to be one of the largest single consumers of expanded shale. In addition to its other qualities, the extremely low volumetric changes of expanded shale concrete make it an excellent aggregate in block manufacture.

# **Phosphate Production**

OUTPUT OF PHOSPHATE CHEMICALS has more than tripled since 1940 and an additional 25 percent increase in capacity is expected by the end of 1953, according to Industrial Bulletin.

Production of phosphorus in 1951 was 160,000 tons, compared with the 1944 wartime peak of 86,000 tons. During the same period, the use of phosphate fertilizers has doubled and plants now being built to produce triple superphosphate will add 30 percent to existing capacity. Consumption of phosphate plant food was over 2,000,000 tons in 1951, compared with 912,000 in 1940.

Prior to 1949, 90 percent of the phosphate industry was in the south-eastern states, but because of the depletion of rock reserves in Tennessee and lack of cheap power in Florida, the industry is tending to move westward. Over 60 percent of the total known reserves of phosphate rock are said to be in Idaho, Montana, Utah and Wyoming. When current western expansion is completed, these four states will account for approximately one-third of the production.

The fertilizer industry is said to be the largest single consumer of sulfur, using 44 percent of the nation's surfuric acid for the manufacture of superphosphate, phosphoric acid and ammonium sulfate. Phosphate fertilizers can be made without sulfuric acid, usually substituting nitric acid, but this involves more complicated operations and requires building new plants. The TVA has developed four processes for treating phosphate rock with nitric acid. Several chemical companies, farm cooperatives and the TVA are interested in building a plant, but present production is limited to TVA's pilot plant.

An additional increase in triple superphosphate production may be expected, as the Atomic Energy Commission wants the uranium which may be extracted as a by-product of phosphoric acid manufacture. Phosphate rock in Florida and the western states is said to contain from 0.2 to 0.4 lb. of uranium per ton. The first full-scale plant to extract uranium is now being built at Joliet, Ill.

#### **Gravel Plant**

PETE CHRISTENSEN and John Calcavecchia, Laurel, Neb., have purchased the O'Brien sand and gravel plant near Harting, Neb., and will operate it under the name of Laurel Sand and Gravel Co.



# "QUICK-WAY"

Reg. U.S. Pat. Off.

Speeds Output
Increases Profits for
ROCK PRODUCT
OPERATORS

Whether its moving shot rock, sand, or crushed stone, stripping overburden or charging bins, you'll find the "QUICK-WAY" in a class by itself in the ¼ to ½ yard field.

The "QUICK-WAY" features low center of gravity, works easily over the side, has proper balance for truck operation, gives you easy, fast swinging, plenty of reserve power, rugged all steel construction, numerous parts interchangeable. 4 models, ¼ to ½ cubic yard shovel, clamshell, dragline, backhoe, 3 to 10 ton crane capacity. Truck speeds to and from jobs. Low initial cost. Low mainte-

nance costs. Eight different attachments,

With a "QUICK-WAY" you'll roll up yardage records hour after hour, day after day. Ask your distributor for a free demonstration or mail coupon.



"QUICK-WAY" Model E dragline with 30' boom loading gravel



Clinker is handled from the pit to the storage pile and from the storage pile to grinding circuit with a mobile "QUICK-WAY" crane

"QUICK-WAY"
TRUCK SHOVEL CO.

Denver, Colorado, U.S.A.



"QUICK-WAY" truck shovel, loading sand

#### MAIL COUPON TODAY

"QUICK-WAY" TRUCK SHOVEL CO.

Dept. 78 \* 2401 East 40th Ave. \* Denver 1, Colorado

Please send me complete details on "QUICK-WAY" Truck Shovels—four different models from 3 to 10 ton crane capacity.

Name

Address

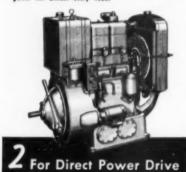
City



"QUICK-WAY" crane with skull cracker attachment eliminates secondary shooting

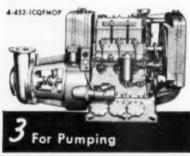


 Mordberg 1, 2 and 3-cylinder Diesel Generator Sats produce from 6 to 30 kilowatts. These sturdy, reliable units are ideal for providing main or standby electric gower for almost every need.



Mordberg Diesel Pawer Units after from 10 to 45 hp for a wide range of straight power requirements,

in direct drive with clutch or slub shaft power take-off.



 Nordberg Biesel Pumping Units ambine low cost, teliable power with efficient centrifugal pumps for practically all pumping jobs up to 3200 gpm.

Write for literature.

NORDBERG MFG. CO., Milwaukee, Wis.

NORDBERG

## **Asbestos Production**

DOMESTIC PRODUCTION of asbestos during 1951 totaled 51,730 short tons, compared with 41,358 tons in 1950, as reported by the Bureau of Mines. The 1951 production also exceeded the high record of 1949, but was said to amount to only 6 percent of domestic requirements. The major production was in Vermont. Moderate supplies of chrysotile, some of it of high quality spinning grade, were obtained in Arizona.

Imports and apparent consumption, as in 1950, exceeded all previous records. Canadian imports again attained an all-time high, but imports of low-iron chrysotile from Southern Rhodesia continued to decline. South Africa supplied all of the amosite and most of the crocidolite (blue asbestos) consumed in the United States. The apparent consumption of asbestos in the United States in 1951 was 796,992 short tons, valued at \$58,771,276. This compares with 727,002 tons, valued at \$46,124,871, consumed in 1950.

# **Metallurgy Courses**

New developments in two phases of metallurgy are being reviewed in special courses in surface reactions in flotation and in chemistry and mechanics of molding materials, at the Massachusetts Institute of Technology.

The special course in surface reactions in flotation was held June 9-13, and emphasized interpretation and coordination of recent data in the light of sound chemical principles. Topics included absorption as a thermodynamic process, the electrical double layer, the effect of crystal structure on the nature of solid surfaces, classification of minerals by flotability, properties of common collectors in aqueous solutions, applications of the ion exchange process, and the pH variable. The course was under the joint direction of Professors H. Rush Spedden and Philip L. de Bruyn, Richards Mineral Laboratory, M.I.T.

The special program in chemistry

and mechanics of molding materials will be given September 1-6, under the direction of Prof. Howard F. Taylor, Department of Metallurgy. Both practical and technical aspects of the subject will be developed in the course. Topics will include the origin, types, location, mining and separation of sands, clays and refractories for foundry uses; physical properties and characteristics currently measured; chemical compositions of materials; bonding action of binders; and physico-chemical characteristics of sands and clays. The technical instruction will also include a treatment of flowability as a physical property of sands, and demonstrations of mechanical packing characteristics under various conditions.

# **Gypsum Production**

DOMESTIC MINE PRODUCTION of crude gypsum during the fourth quarter of 1951 totaled 2,026,829 short tons, as reported by the Bureau of Mines. This was a decrease of 14 percent compared with the output for the same quarter in 1950. Production of calcined gypsum also declined 14 percent, while output of gypsum lath and wallboard declined 20 percent and 4 percent, respectively.

and 4 percent, respectively.

Production of agricultural gypsum increased 22 percent, compared to the fourth quarter, 1950, output. Certain building plasters also showed moderate gains. Greatest declines were shown by fillers and unclassified uncalcined uses, tile, miscellaneous building uses and Keene's cement—each with a decrease of 30 percent or more. Base-coat plaster also decreased sharply.

Totals for the year showed slight gains in 1951 over 1950 totals, except in the plasters. Agricultural gypsum production increased 60 percent, the most outstanding gain of any classification. The total domestic crude gypsum mined in 1951 amounted to 8,-704,852 short tons, an increase of 7 percent over 1950 figures. Imports showed a 4 percent gain.

Production of gypsum and gypsum products was listed as follows:

	Fourth quarter		Yearly totals	
	1951	1950	1951	1950
Crude gypsum:				
Mined	2,026,829	2,354,711	8,704,852	8,119,126
Imported	858,748	967,317	3,307,567	3,190,600
Calcined gypsum produced	1,681,158	1,949,942	7,477,155	7,344,309
Gypsum products used or sold:				
Uncalcined uses:				
Portland cement retarder	465,175	481,993	1,836,571	1,732,827
Agricultural gypsum	164,816	134,621	671,589	420,844
Fillers and unclassified	6,375	10,219	33,330	31,463
Industrial uses:				
Plate glass and terra-cotta	14,457	16,027	62,769	62,527
Pottery planters	11,659	13,353	48,365	48,574
Dental and orthopedic plasters	2,888	3,132	11,332	10,762
Other industrial uses	42,373	41.696	165,680	141,270
Building uses:				
Plantern:				
Base-cont	471,072	595,988	2,165,515	2,334,468
Sanded	32,387	31,237	124,442	125,692
To mixing plants	3,388	4.326	16,179	17,322
Gauging and molding	46,417	53,819	202,427	220,914
Prepared finishes	3,785	4,752	18,562	19,604
Other building plasters	60.059	53,275	246,133	169,465
Keene's cement	10.648	15,200	53,740	57,771
Lath*	602,500	754,849	2,762,254	2,793,720
Wallboard and laminated board*	750,329	781,259	3,243,698	2,903,291
Sheathing*	26,525	26,475	116,204	112,617
Tile and miscellaneous*	7,763	12,012	37.861	45,033

\*M sq. ft. All other figures refer to short tons.



# the NEED

In the face of ever heavier traffic loads, rising costs and lack of funds greatly limit new construction and place an ever greater burden on maintenance programs in city, town, county and state. For this work even the best patch is none too good. Yet until the advent of the new Mixall, an efficient and economical means of producing all types of hot high quality patch material has not been available.

# is ANSWERED

A small, highly portable unit, capable of on-the-spot production of even the highest types of hot mixes comparable to those produced in Barber-Greene's largest continuous hot mix plant—that is the Mixall. Its range of usefulness extends throughout the field of road maintenance into small paving and resurfacing jobs.

In the Mixall, Barber-Greene offers a unique and effective combination of an efficient rotary drum aggregate dryer with a proved B-G twin shaft heated pugmill mixer. It is rightly called the Mixall because of all the things it can do . . .

- Mix all quantities: from a single 300 lb. batch up to 5 tons per hour of hot mix—or up to 10 tons per hour of cold patch.
- ••• Mix in all locations: towed to the job by truck loaded with aggregate . . . fed directly from truck or from stock pile or pit. Can work in a single traffic lane. No set-up time required.
- ... Mix in all weather: heated aggregate makes low atmospheric temperature mixing possible — allows quick repair to prevent major failures.
- ... Mix all types: of bituminous materials including stabilized mixes—as well as low slump Portland cement mixes.

BARBER-GREENE COMPANY, AURORA, ILLINOIS, U.S.A.

Barber-Greene

nd me the descriptive 8-page bulletin on the Mixall.
ime
m Name
Idress
ty State

# For the War Against Wear in the Fight for Economy

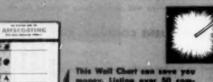
# VSCO

Manganese and Hardfacing Rods

# AMSCOATING

impact and abrasion are always at work but their effects can be postponed through the use of AMSCO Welding Products. Reclamation and rebuilding of worn or damaged equipment parts by Amscoating means dollar-saving, long-lasting protection. The lelivery AMSCO Hardfacing System successfully fights wear caused by impact, abrasion, heat or corrosion. It assures longer equipment life and fewer repairs.

For prompt delivery of these welding products, contact your AMSCO distributor.



AMSCO AW-79 will meet every requirement for better control of wear where abrasion and impact are important factors—plus all the advantages of automatic welding. Especially suitable for rebuilding and hardfacing tractor rollers, steel wheels, sheeting rolls, dredge pins as well as dozens of other applications. 1/2 and 1/4 in 221/2 ID.,

AMSCO No. 459 for severe abrasion, mild impact. Has excellent abrasion resistance. All diameters, bare and

coated.

AMSCO No. 217 for abrasive service up to 1100° F.

The deposit retains hardness at high temperatures. All diameters, bare and coated.

AMSCO No. 6 for combination of corrosion or abrasion, or for 1000° service and above. Used as facings for tool and die applications. No. 1 has greater abrasion resist-

AMERICAN **Brake Shoe** COMPANY

Other Plants: New Castle, Dol., Denver, Oakland, Cal., Los Angeles, St. Louis.



# WELDING PRODUCTS

Manganese Steel Bars and Shapes

# CONTROLS IMPACT and ABRASION

Through many years' experience in the production and application of manganese steel-"the toughest steel known"-AMSCO has developed welding products designed solely to conserve and protect parts exposed to impact and wear. American Brake Shoe Company's scientists and engineers are working continuously to build better defenses against wear in machines and equipment.

AMSCO Welding Rods are known for their excellent service in many applications—from rock crushers to materials handling pumps . . . in forging, rolling, stamping, and cutting . . . for gears, sprocket wheels and clutch cams . . . in grinding, mixing, and chipping operations . . . Whatever your problem of wear, there's a "proved-in-service" AMSCO Hardfacina Product that can solve it.

ance; No. 6 is the taugher, and can be machined. All diameters, bare and coated.

AMSCO No. 1 for combination of corresion or abrasion, or for 1000° service and above. Used as facings for tool and die applications. No. 1 has greater abrasion resistance; No. 6 is the tougher, and can be machined. All diameters, bare and coated.

AMSCO FARMFACE or AMSCO CHROMEFACE for industrial and farm use. Deposit has excellent resistance to low stress sliding abrasion. All diameters, bare and coated.

AMSCO AIR-HARDENING for abrasion and severe impact. Deposit can be forged to a sharp edge without impact. Deposit can be forged to a sharp edge without losing hardness. All diameters, bare and coated.

AMSCO HF-40 for severe abrasion and moderate impact. Deposits of HF-40 are hard and abrasion resistant.

All diameters, coated only.

AMSCO HF-60 for moderate impact and severe abrasion. This rad is particularly suitable for application in both flat and vertical positions. All diameters, coated only.

AMSCO CO-MANG for build-up on manganese steel castings exposed to severe impact. Deposit has excellent impact resistance. All diameters, coated only.

AMSCO TOOLFACE for metal to metal wear up to 1000° F. Toolface deposits have excellent abrasion resistance. All diameters, bare and coated.

ISCO DIEWELD for tools and dies. Deposit may be sed for machining and rehardened. Retains a keen

SCO V-MANG for build-up on manganess castings sed to impact.

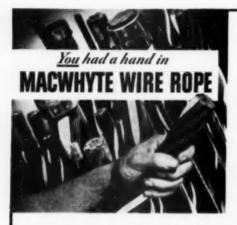
TUNGSTEN CARBIDE.

A complete line of manganese steel dipper tooth repointer bars and other shapes are available.

# AMERICAN MANGANESE STEEL DIVISION

377 EAST 14th STREET . CHICAGO HEIGHTS, ILL.

In Canada: Joliette Steel Division, Joliette, Que. Ameco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.



# A thousand and one

# **WIRE ROPES**

# PREformed and internally lubricated

THE EXPERIENCE OF hundreds of users—like yourself—goes into the making of Macwhyte Wire Rope. Their needs and yours have been studied by our engineers to produce the best wire rope for every type of quarry equipment.

Ask for G-15 Catalog

# MACWHYTE COMPANY

2949 Fourteenth Ave., Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Catalog available on request.

Mill depols: New York - Pittsburgh - Chicago - Minneapolis - Fort Worth - Portland -

Seattle • San Francisco • Los Angeles. Distributors throughout U.S.A.

You get the correct wire rope for your equipment when you buy Macwhyte

101



# Rocky's Notes

(Continued from page 39)

is to be able to present the results of their research in such form that the so-called practical man, with only an elementary knowledge of structural and colloid chemistry, can apply them.

Prof. Kenneth B. Woods, chairman of Committee C-9 on Concrete and Concrete Aggregates, A.S.T.M., for example, submits this problem in the April A.S.T.M. Bulletin: "The aggregates (sand and coarse aggegate) used in making concrete sometimes undergo chemical reactions within the concrete. These chemical reactions may be beneficial to the extent that they increase the strength or they may be detrimental in that they cause expansion and pattern cracking in the concrete." When the structural and colloid chemistry of concrete is fully understood, we believe the answer will be so simple that we will wonder why we were stuck with it so long a time.

## **Labor Relations Trends**

(Continued from page 41)

contractors of liability for the acts of their secondary contractors in those instances in which the act is applicable to the secondary contractor."

In the meantime the Banking and Currency Committee of the Senate acted on proposals to amend the Walsh-Healey Act, as a rider to renewal of the Wage-Price Controls Act, which it is proposed to extend to March 1, 1953. One of these riders was aimed at preventing the Labor Department from establishing minimum wages under the act on a national basis rather that on a local basis, as the act was originally designed to do. This proposal was voted down in committee, but in doing so, the committee said that its action was "without prejudice to further deliberations of the courts concerning the meaning of 'locality' as the term is now used in the wage-determining provisions of the act."

The Senate committee did approve an amendment which would change the provisions for "open-market" purchases by the government. The committee explained: "The present language of the statute exempts 'purchases of such materials, supplies, articles or equipment as may usually be bought in the open market.' Your committee believes that the construction placed or this language by the Secretary of Labor has been unduly restrictive and has resulted in the act applying to certain contracts which Congress in enacting the statute had intended to be exempt. Accordingly, the bill modifies the statutory language to conform to what your committee regards as the original Congressional intent. The bill would specify as exempt those pur-

SOLE PRODUCERS 92 N. J. RAILROAD AVE. NEWARK, N. J.

Use MANGANAL Bare or Special TITE-KOTE

ELECTRODES to fill in low spots on Gyratory

Mantles and to attach Applicator Bars.

# FREE

Literature on the latest methods for speedy and economical repair of worn equipment.

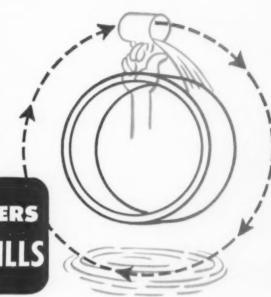
Name of nearest distributor on request.

# Malac Stowy

# of Allis-Chalmers Oil Lubricated Trunnion Bearing...

AN OILING BUCKET inside this Allis-Chalmers trunnion bearing revolves with the trunnion . . . lifts oil from the reservoir in the bottom of the bearing housing to an oil distributing pan above the bearing. From here it floods down onto the bearing, lubricating the full face of the bearing uniformly and continuously.

You'll always have the comforting assurance that the all-important trunnion bearing on your mill is being dependably lubricated. This assured protection of internal lubrication is standard on all Allis-Chalmers oil lubricated bearings — even on installations where a separate external oiling system is used.







These protective features of A-C trunnion bearings also give you savings in power and maintenance —

- ★ An improved seal keeps dirt out of oil and has been designed to provide for mill expansion.
- ★ A hand operated, high pressure lubricant pump "floats" the mill after shut-down . . . eliminates dry starting.
- ★ If desired, an external system for filtering and cooling can be added to the internal oiling system.

Get more facts from the Allis-Chalmers representative in your area, or write for Bulletin 07B6718A, Allis-Chalmers, Milwaukee 1, Wis,

# **ALLIS-CHALMERS**



Sales Offices in Principal Cities in the U.S.A. Distributers Throughout the World.





Vibrating Screens



In Caushass



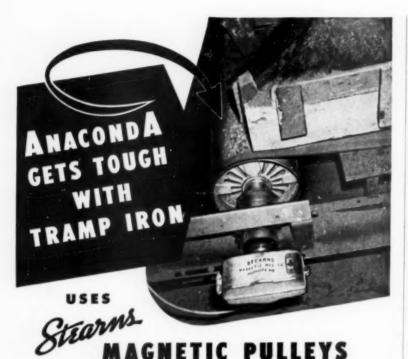
**Gyratory Crushers** 



Grinding Mills



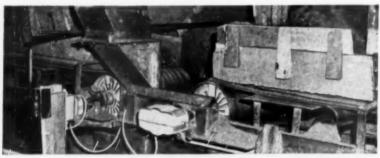
Kilns, Coolers, Dryers



POSITIVE Here's the economical, positive way to use a STEARNS Electro-Magnetic Pulley to eliminate all tramp iron from your material. That's exactly what Anaconda Copper Mining Company is doing at their Conda, Idaho plant; two STEARNS Magnetic Pulleys remove all scrap metal from phosphate rock before crushing.

AUTOMATIC If you want to avoid costly damage to STEARNS offers a crushers, grinders, screens and other equip- complete line of ment, install a STEARNS Magnetic Pulley for con- Electro and Permatinuous and automatic removal of tramp iron. Whether you are handling rock, ore, slag or leys. Write today for crushed stone, STEARNS has EXPERIENCE ENGI- descriptive literature. NEERED equipment to meet your requirements.

nent Magnetic Pul-



Installed in the Crushing and Drying Plant, these two STEARNS Magnetic Pulleys are the effective answer to the tramp iron problem.



675 South 28th Street, Milwaukee 46, Wisconsin

chases of materials, etc., 'of standard type and construction' as are usually sold in the open market to 'purchases generally, regardless of the method of procurement used by the government '

Whether agricultural limestone, sand and gravel, crushed stone or ready-mixed concrete in small amounts would come under the exemption is something to be determined.

The committee also approved an amendment which would curtail the high-handed methods and decision of the act's administrator by making his decisions subject to review by the courts-that is, all orders, determinations, rules and formal interpretations of general applicability under the act. It is to be hoped that this may prove an opening wedge to protect employers against other arbitrary acts and rulings of the Labor Department's administrator of the Fair Labor Standards Act. Before the committee voted on these proposed amendments the President sent it a message urging rejection of all three proposals.

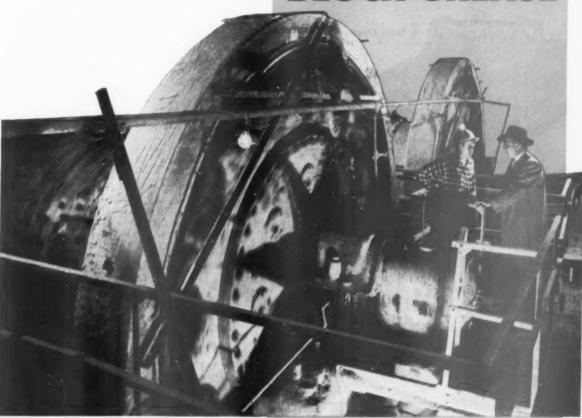
Congress will probably have acted upon these matters before this issue of ROCK PRODUCTS is in the hands of our readers, but they should be interested in all measures designed to relieve them of arbitrary personal government, especially with a national election in the offing. Naturally, the labor union bosses are opposing these changes. However, they do constitute some of the minor issues involved in the election. At this stage, many Congressmen appear to be more willing than formerly to give employers a little more decent treatment if not a fair break.

## **Walsh-Healey Act Penalties**

The Secretary of Labor has obtained a decision in the U.S. Court of Appeals in Philadelphia which casts some doubt on the decisions of the U.S. Courts of Appeal at New Orleans and at Richmond, Va., referred to on our "Notes" page of the February issue. In both these cases the courts decided that the statute of limitation, prescribed in the Portal-to-Portal Act, applied to the Labor Department's suits to recover liquidated damages for the government as well as to claims of the employes. Both cases were brought for alleged violations of the Walsh-Healey Act. In the present case the Appeals Court at Philadelphia held that the statute of limitation did not apply to the Secretary of Labor's suit for liquidated damages against an employer who was held to have violated the Walsh-Healey Act by the employment of underage persons. One of the previous cases decided against the Secretary of Labor also involved to a limited extent an alleged violation of the child-labor provisions of the act. The Supreme Court refused to review the New Orleans decision, but now may be persuaded by the Secretary to re-

# Ball and rod mill bearings stay COOLER with

# GULF BLOCK GREASE



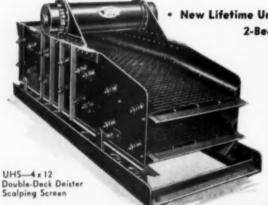
Gulf Block Grease can help you increase open-top bearing life and reduce maintenance costs. It's equally effective for cement-kiln, crusher, and pulverizer bearings. Ask a Gulf Lubrication Engineer for complete details. Write, wire, or phone your nearest Gulf office, Gulf Oil Corporation Gulf Refining Company, Pittsburgh 30, Pennsylvania.

# 5 reasons why:

- 1 constant melting rate
- 2 nonglazing
- 3 effective up to 285°F.
- 4 excellent oiliness characteristics
- 5 clean-noncarburizing







New Lifetime Unitized Headmotion—

2-Bearing Construction—

Runs In Bath of Oil

Opposed Elliptical Throw • Powerful Vibration • Automatic Screen Cloth Tension • Vibration Fully Cushioned • Rugged Construction

New DEISTER
Electric Heating Unit

# for SCREENING DAMP MATERIALS

NO DOWN TIME for cleaning fine or medium screen cloth—you can screen fine, moist materials continuously with the new DEISTER heating unit.

**GREATER CAPACITY**—more tonnage goes through—you get better separation—because heated screen cloth *remains* open.

CUTS COSTS—In addition to saving cleaning time and labor costs, DEISTER heating units will lengthen life of your screen cloth up to three times by eliminating pounding or brushing to free it of blinding material. Get more details from your nearest Deister dealer, or phone, write or wire the Deister Machine Company, Fort Wayne, Indiana.



New Deister Electric Heating Unit.

ALL REPORTS

DEISTER MACHINE COMPANY

FORT WAYNE 4, INDIANA

view all three Appeals Court decisions since there is obviously some conflict.

These cases are important to rock products producers because of the nature of the alleged hazards of operation, the employable age limit is higher than in two of the cases reviewed here.

# Small Crushed Stone Plant

(Continued from page 82)

screen is stockpiled as finished material and throughs are delivered to a Williams hammermill powered by an International UD-24 engine. Discharge setting on this crusher varies from ¼ to 1 in., depending on what size is in greatest demand. Oversize from the revolving screen, plus 1½-in. material, is stockpiled as finished material.

Stockpiles, radiating from the plant, are built by Barber-Greene belt conveyors. A conveyor belt operating in a reclaiming tunnel under the sand pile discharges directly to trucks, while other sizes are reclaimed from stockpiles by a 1-cu. yd. Hough end loader and a Barber-Greene bucket loader. The end loader is rubber tired and the bucket loader is mounted on crawler treads. All finished sand and gravel is hauled from the plant by a contract hauler.

A 170-hp. General Motors diesel engine powers a Worthington air compressor that supplies air to force 600 g.p.m. of water from a well under the plant. The same diesel engine supplies power for a small pump that raises the water to the screens as wash water.

Main office of Crystal Lake Crushed Stone Co. is at Sheboygan, Wis. Officers of the company are A. Matt Werner, president; E. H. Clemens, general manager; and William Fricke, plant superintendent.

# Merchandising Ideas

(Continued from page 86)

N.A.L.I. A similar scroll was prepared for Vincent H. Shea, Hoosac Valley Lime Co., Inc., Adams, Mass., for his efforts leading to the merger. Mr. Shea, however, was unable to be present to receive the scroll.

Mr. Koch gave a short after-dinner talk summarizing the industry's stake in conservation and in the A.C.P. authorization. He then narrated during the showing of a Department of Agriculture slide series, "The Fifth Plate." This strikingly brought out much of the economics of the conservation program. As an example, if taxes were cut by \$300,000,000 (once the A.C.P. appropriation) it would mean a reduction of only 0.003 cents in each individual's tax bill.

A luncheon was also held during the meeting. Edward McFaul, a nationally known speaker, humorously analysed man's sense of humor.

# CHRYSLER INDUSTRIAL



offers Greater Power, More Efficiency!

Here's why . . . The great new Chrysler V-8 Industrial Engine is completely new in V-8 design. This engine embodies more desirable characteristics than ever before offered to Industrial engine users.

Hemispherical Combustion Chamber provides 33 per cent more horsepower, 16 per cent higher torque. It increases displacement only 3.2 per cent,\* yet develops more power for displacement than any comparable engine in Industrial use. It is today's most nearly perfect combustion chamber! It allowed many desirable changes in V-8 design—most important of which are larger and wider spaced valves and "free-flow" intake and exhaust porting.

Centered Spark Plugs provide shorter flame travel through fuel. You get greater power from the same amount of fuel; easier, faster starting, plus less carbon deposit in the chamber, adding years to engine life.

Overhead Lateral Valves are larger, wider spaced. They operate cooler, eliminating preignition. This ingenious valve arrangement permits gravity flow of the fuel and air mixture into intake and out of exhaust ports—practically eliminates back pressure.

More Efficient Cooling is due to less heat rejection in the combustion chamber. More heat is turned to power. More coolant flows around valves and bore. Water jacket completely surrounds cylinder. With less coolant this new engine has better cooling—a more compact, efficient, over-all cooling system!

These are only a few of the important developments made in Chrysler Industrial V-8's. There are many more. These engines will give you a whole new conception of Industrial power. Ask a Chrysler Industrial Engine Dealer to explain their advantages on your jobs, or write us direct for full information. Marine and Industrial Engine Division, Chrysler Corporation, 12200 E. Jefferson Ave., Detroit 31, Michigan.

\*Model IND-20



# SYNTRON

# Controlled

"Vibration"



BIN VIBRATORS
Make Stubborn Materials Flow Freely



VIBRATORY FEEDERS
Finger-Tip Control of the Rate
of Bulk Material Flow

# For Material Handling Efficiency

Free-flowing bins, hoppers and chutes — variable control of material flow, feeding from pounds to bundreds of tons per hour — coarse separation and scalping — weigh feeding and batching — of bulk materials, hot or cold, dry or damp, coarse or fine — add up to faster processing at lower costs.



VIBRATING GRIZZLIES

Both Feed and Scalp

With One Unit



Syntron Electromagnetic Vibration, without the use of wearing, mechanical parts such as spiral screws, cams, etc., assure cheaper operation and low maintenance.



"CONSTANT WEIGH" FEEDERS Accurate, Continuous Feed by Weight

450 Lexington Avenue



"Automatic" BATCH WEIGHING Scale—Controlled Vibratory Feeders

Write for Your FREE Copy - Syntron Catalog No. 519

SYNTRON

COMPANY

Homer Cit

Penno

# NEW INCORPORATIONS

Precast Concrete Panels, Inc., Columbus, Ohio, was recently granted a corporation charter. Authorized capital consists of 250 shares of stock.

Waupun Ready-Mix Concrete Corp., Waupun, Wis., has been incorporated with 600 shares of stock, par value, \$100. The incorporators are Alan Densmoor, D. P. Cupery and J. Gordon Hull.

Conneaut Concrete Products, Conneaut, Ohio, was recently incorporated by Melvin M. Roberts, William D. Howell and Marylou Stucky.

Mukwonago Concrete Products, Inc., Waukesha, Wis., has been incorporated by Robert E. and Helen B. Miller and Bernard K. Lyon, with 100 shares of stock, no par value. Minimum capital was listed at \$500.

Haebroce & Jensen, Flagstaff, Ariz., has been incorporated by Pat Haebroce and Martin Jensen. The firm will deal in sand and gravel.

Meadow Hill Quarries, Inc., Sussex, Wis., was recently incorporated with 100 shares of stock, par value, \$100. Minimum capital was listed at \$500. The incorporators are Burtel, Howard and Leonard Ische.

Midland Concrete Co., Inc., Midland, Texas, has been granted a 50-year corporation charter. Capital stock was listed at \$100,000. The incorporators are Lonnie B. Sikes and Hubert and Lucille McClure.

bert and Lucille McClure.

Hillview Sand & Gravel Corp.,
Waukesha, Wis., has been incorporated with 400 shares of \$100 par value stock and a minimum capital of \$500.

Edward E. Sunner, Calvin Christopher and P. R. Lembezeder are the incorporators.

The Dresden Concrete Pipe Corp., Zanesville, Ohio, was recently incorporated with 500 shares of common stock, no par value. The incorporators are Leo Dunlap, Vic Senter and Gaylon Plummer. Mr. Dunlap is also listed as statutory agent.

Valley Crushing Co., Inc., Olympia, Wash., has been incorporated with a listed capitalization of \$50,000. The firm will deal in sand, gravel and concrete. Forest M. Garrett, Robert J. Jarvis and William Tanks, all of Spokane, Wash., are the incorporators.

White's Concrete Manufacturing Co., Littlefield, Texas, has been incorporated by G. A. White, Robert A. Bingham and Gilbert L. White. Capital stock was listed at \$10,000.

B& G, Inc., Topeka, Kan., was recently granted an incorporation charter to deal in crushed limestone, sand, gravel and other building materials. The incorporators are H. W. and Hazel D. Gerlach and G. W. and Mildred M. Baker. Ralph F. Glenn is resident agent.

A new sand and gravel company at Tucson, Ariz., has been formed by Ralph Carrasco.

Continuous Concrete Pipe Co., Phoenix, Ariz., has been incorporated by Audie Lydal and Martin Colvin. The JOY Champion sets absolutely new standards in blast-hole drilling. Months of operation in field after field have proved that it drills many times faster, and at far lower cost per foot, than any other drill on the market. Here's why...

REVOLUTIONARY DESIGN: The Champion Drill continuously pressure-cuts the rock with a rotating, tri-cone roller bit. It operates quietly, no deafening hammer strokes.

DRILLS DRY: No water-line or coldweather freezing problems. Cuttings are instantaneously removed by an air-blast, and trapped and collected. The bit is always working on virgin rock, and even in dense, dolomitic limestone, bit life is exceptionally long.

NO LOST HOLES: Rigid drilling stem, plus controllable feed-pressure and rotation speed, prevent bit wander in bad ground—you finish every hole you start.

Champion drills smooth-walled vertical holes, 5%" to 7%" dia., to any normal depth desired and as straight as a gun barrel. They load easier and safer, and give better blasting results.

Built in two models—the Joy Heavy-weight and Middleweight Champions—each with choice of diesel or electric drive. • Send us samples of your rock for a performance estimate.

JOY builds the CHAMPION BLAST HOLE DRILL



# JOY MANUFACTURING COMPANY

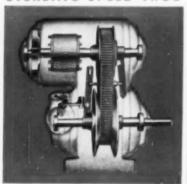
GENERAL OFFICES: HENRY W. OLIVER BUILDING . PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

# Old Equipment Modernized With Speed-Trol

Speed-Trol with electric remote control, used in modernizing our stone cutting saw, increased production, reduced maintenance costs, improved employee morale by simplifying operations and improving safety, and required 75% less mounting space, reports P. J. Sarni, Vice-President, Freeport Marble and Tile Co., Inc. Speed-Trol replaced a cumbersome variable speed transmission, flat belt drive with tight and loose pulleys, and a clutch.

# STERLING SPEED-TROL



# **OUTSTANDING FEATURES:**

Infinite speeds—positive speed regulation—fingertip control—large indicator—positive pulleys—no springs—belt tension in proportion to load—protected—streamlined—Herringbone Rotor—through ventilation—versatile mounting—NEMA dimensions—shock absorbing—quiet operation—rugged—compact—dependable—long life.

70 ILLUSTRATIONS showing how Sterling Electric Power Drives reduce production costs. Write for Bulletin No. B 115.

# STERLING ELECTRIC MOTORS

Plants: New York City 51; Van Wert, Ohio; Los Angeles 22; Hamilton, Canada; Santiago, Chile Offices and distributors in all principal citles

# **Crushing Practice**

(Continued from page 68)

or 10 mesh on harder material. They cannot compete with the hammermill on non-abrasive stone, but they will handle hard and abrasive materials—a field from which the hammermill is excluded because of prohibitive maintenance.

(To be continued)

# Cement Content of Concretes and Mortars

The cement content of hardened mortars and concretes may be obtained by a disintegration which enables the aggregate grading to be reconstructed, followed by a chemical analysis of the fines, as recently reported in Highway Research Abstracts. The calculation of the content of the binder is done on the basis of a constituent provided solely by the cement, most commonly the soluble silica. A measurement of the apparent density enables the volumetric mix to be calculated.

Errors can be caused by: aggregates which liberate silica; by the concrete being carbonated; or by the use of binders with variable indices of hydraulicity. It was stated that although it is possible to eliminate easily some of these disadvantages, lime mortars (especially gauged mortars) are always difficult.

As proved by experimental work, if the soluble silica content of the cement is known, the cement content can be obtained within a  $\pm$  5 percent accuracy. If the soluble silica content is unknown, the accuracy is  $\pm$  10 percent

Sampling was said to be extremely important and the frequent heterogeneity of concrete structures should also be taken into consideration.

# Strain Gauge for Concrete

A REPORT, issued recently by the National Bureau of Standards, describes a waterproof internal strain gauge developed by Rudolph C. Valore, Jr., associated with N.B.S. The gauge is said to provide a simple method for determining internal strain, thermal expansion, or drying shrinkage in hardened concrete. A special feature of the gauge is that it can be embedded in concrete during fabrication of a test specimen or structural member.

The gauge is a modification of the commercially available "SR-4" bonded-wire resistance strain gauge. The SR-4 or "postage-stamp" gauge consists of a loop, grid or flat helix of 0.001-in. dia. cupro-nickel or other wire "sandwiched" between layers of paper bonded together by a nitro-cellulose adhesive, or within a thin Bakelite laminate. As the wire sensing element undergoes extension or shortening, its electrical resistance changes in proportion to the dimensional changes. A bridge-type, null-setting indicator supplies the current

to be passed through the gauge element. When the gauge constant has been set on the dial, strain may be read directly in micro-inches per inch. These gauges have had wide use during recent years in the experimental stress analysis of metals.

Waterproofing of the gauge was accomplished by bonding an A-9 gauge to the inner sides of a rectangular metal foil envelope by means of a thermosetting adhesive. A rolled brass shim, 0.001 in. thick, was said to be the most satisfactory metal foil of those tried.

The metal-encased gauge is embedded within a concrete specimen by insertion at the desired position and orientation immediately following the placing of the fresh concrete. Transfer of strain from the hardened concrete to the gauge is provided by the bond of the cementwater paste in the concrete to the metal foil.

The N.B.S. internal gauge was said to have performed satisfactorily in stress-strain determinations made upon cylindrical concrete specimens in compression, in measurements of drying shrinkage of concrete prisms dried for 100 days, and in the measurement of linear thermal expansion.

Tests are now being made to evaluate the stability of the internal gauges over longer periods and to compare directly the performance of the gauges with that of the mercury-displacement dilatometer.

# STEEL

# Prompt Delivery from Stock

Some steel products are in short supply but our over-all stocks are still large

Plates, Structurals, Bars, Sheets, Tubes, etc. Carbon, Alloy, Stainless Steels, Babbitt Metal.

# RYERSON

Joseph T. Ryerson & Son, Inc. Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco, Seattle, Spokane CONTROLLED IMPACT ACTION

# PAYS OFF

for GALLAGHER & NELSON

at MADISON, WISCONSIN



SINGLE 3240 PMCO IMPACT MASTER DOES COMPLETE CRUSHING JOB IN MODERN CLOSED CIRCUIT SETUP

Pays off with lower plant investment. High ratio of reduction eliminates secondary crushers and auxiliary equipment.

Pays off with better quality cubical product. Breaking is accomplished by rigidly mounted rotor hammers producing a high quality cubical aggregate.

Pays off with greater control over finished product size. Simple machine adjustments change the percentage of sizes in the finished product.

Pays off in less horsepower per ton. Average production of 150 tph. 2½" minus using less than 1 h.p. per ton. Peak production potential of 250 tph.



Portable 3240 Impact Master with 36" x 12' apron feeder, 30" delivery conveyor, Murphy ME6 power, 30" plant conveyor, 5' x 14' 3 deck vibrating screen, 18" return conveyor.

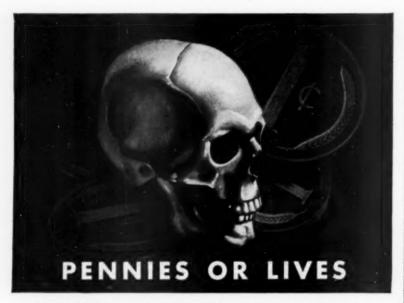
You can depend on Controlled Impact Action to PAY OFF for you. PMCO Impact Masters are built with capacities to 500 tph. Write today for job-proved facts on the size that meets your requirements. PMCO Impact Master Division, Universal Engineering Corporation, Cedar Rapids, Iowa.

UNIVERSAL ENGINEERING CORPORATION division of PETTIBONE MULLIKEN CORP.

625 C Avenue N.W., Cedar Rapids, Iowa

4700 W. Division St., Chicago 51, Illinois Phone Spaulding 2-9300







Behind many industrial accidents is the ghost of equipment failure, often caused by skimping on quality in favor of a few cents saved.



Such economies are always risky, always more costly in the



But when you use Laughlin Safety Hooks (and there are 15 sizes in eye, shank and swivel patterns) the extra pennies you spend will pay big dividends in protection of men and equip-

The latch locks the load. It cannot open until released by the operator. And it's made of pressed steel or bronze with a stainless steel spring that won't rust or weaken. The cam is an integral part of the hook forging for extra strength.

The quality construction of Laughlin Safety Hooks is typical of all of Laughlin's 1500 types and sizes of drop forged wire rope and chain fittings. So remember - to save with safety always insist on the name LAUGHLIN for original equipment or replacement fittings.

Our Catalog No. 150 shows and describes the complete line. A free copy will be sent on request.

THE THOMAS LAUGHLIN CO. 78 FORE ST., PORTLAND, MAINE

THE MOST COMPLETE CHAIN FITTINGS

# **Bureau of Mines** Safety Awards

SIX MINES, QUARRIES and open-pit mines whose safety records were the best in their respective groups in 1951 were recently awarded "Sentinels of Safety" trophies for the 27th National Safety Competition, sponsored by the Bureau of Mines. Certificates of Achievement were also awarded to 128 other plants which had injuryfree records, or which finished second, third, fourth and fifth in their respective divisions.

The trophy winner of the stonequarry group was the Port Inland quarry of Inland Lime and Stone Co., Gulliver, Mich., which worked 808,389 man-hours without a lost-time injury.

Plants in the rock products industries receiving Certificates of Achievement were:

## **Nonmetallic Mineral Mines**

No. 5 mine, Bessemer, Ala., operated by Tennessee Coal, Iron & Railroad Co. Crestmore limestone mine, Riverside, Calif., operated by Riverside Cement Co. Grand Rapids gypsum mine, Grand Rapids, Mich., operated by Certain-teed Products Corp.

Mich., operated by Certain-teed Froducts Corp.
Clarence Center gypsum rock mine, Clarence Center, N.Y., operated by Certain-teed Products Corp.
Jonathan limestone mine, East Fultonham, Ohio, operated by Pittsburgh Plate Glass Co. (Columbia Cement Division).
Ironton limestone mine, Ironton, Ohio, operated by Alpha Portland Cement Co.
Kaylor limestone mine, Kaylor, Penn., operated by United States Steel Co. (Michigan Limestone Division).
Bell limestone mine, Bellefonte, Penn., operated by Warner Co. (Bellefonte Division)
No. 9 limestone mine, West Winfield, Penn., operated by Warner Co. (Bellefonte Division)
No. 9 limestone mine, Co. (Bellefonte Division)
Manheim limestone mine, Manheim, W. Va., operated by Alpha Portland Cement Co.

#### **Open-Pit Mines**

Peace Valley phosphate rock mine, Bartow, Fla., operated by International Minerals and Chemical Corp.
Pauway No. 4 phosphate rock mine, Bartow, Fla., operated by Davison Chemical Corp.
Achan phosphate rock mine, Mulberry, Fla., operated by International Minerals and Chemical Corp.
Bonny Lake phosphate rock mine, Bartow.

Chemical Corp.

Bonny Lake phosphate rock mine, Bartow,
Fla., operated by Davison Chemical Corp.

Monsanto phosphate matrix mine. Columbia,
Tenn., operated by Monsanto Chemical Co.

#### Quarries

Dolonah dolomite quarry, Bessemer, Ala., op-erated by Tennessee Coal, Iron & Railroad Co.

Stephens limestone and shale quarry, St. tephens, Ala., operated by Lone Star Ce-

St. Stephens Ilmestone and many state of the Stephens. Ala., operated by Lone Star Cement Corp. Birmingham limestone quarry, Birmingham, Ala., operated by Lone Star Cement Corp. Leeds limestone, shale and sandstone quarries, Leeds, Ala., operated by Universal Atlas Cement Co. Okav challe quarry, Okay, Ark., operated by Okav challe quarry, Okay, Ark., operated

kay chalk quarry, Okay, Ark., operated by Ideal Cement Co.

Okay chalk quarry, Okay, Ark., operated by Ideal Cement Co. Boettcher limestone quarry, LaPorte, Colo., operated by Ideal Cement Co. Natividad dolomite quarry, Salinas, Calif., operated by Kisner Aluminum & Chemical Corp.

Jensen limestone quarry, Riverside, Calif., operated by Riverside Cement Co.

Permanente cement quarry, Permanente, Calif., operated by Permanente Cement Co.

Middlefield No. 1 crushed stone quarry, Middlefield Conn., operated by The New Haven Trap Rock Co.

Plainville No. 4 crushed atone quarry, Plainville, Conn., operated by The New Haven Trap Rock Co.

Clinchfield limestone quarry, Clinchfield, Ga., operated by Penn-Dixie Cement Corp.

Bailey Falls limestone quarry, Oglesby, Ill., operated by Marquette Cement Mannfacturing Co.

Dixon limestone quarry, Dixon, Ill., operated by Meduas Portland Cement Co.

Oglesby limestone quarry, Oglesby, Ill., operated by Lehigh Portland Cement Co.

only allis-Chalmers\_offers

HISTORY-MAKING

# Tracto-Shovel Advantages

now in 3 new, BIGGER SIZES ... 1-YD. HD-5G 3-YD. HD-15G 4-YD. HD-20G

Thousands of Allis-Chalmers HD-5G 1-yd. front-end shovels are making history... handling an endless variety of excavating and material handling jobs faster, at lower cost than ever before.

Now . . . to meet the challenge of ever-increasing production demands, Allis-Chalmers multiplies the scope of tractor usefulness even more. And here's how. The same basic design — the same versatility that made the HD-5G so useful can now be yours in the 2-yd., 3-yd., and 4-yd. Tracto-Shovels. Combined with the unmatched performance of the new Allis-Chalmers tractors, they give you a real competitive advantage by bringing you a new, faster and better way of getting the job done.

A NEW ERA OF TRACTOR USEFULNESS



**Pioneering New Methods** — Tracto-Shovels are blazing new trails in excavating and material handling . . . doing traditional jobs in a new, better way.

A Size for Every Job - Faster, more efficient operation at lower investment.

**All-'Round Versatility** — Not limited to a specific type of operation. Fourteen quickly interchangeable attachments adapt Tracto-Shovels to different assignments in minutes. Simple truck or trailer transportation between jobs.

**Built to Take It** — These new Tracto-Shovels are the toughest, strongest ever built. Every part has ample size and strength to do its job.

### World's Largest Front-End Shovel

— handles toughest excavating and material handling jobs in a new, faster, better way. Standard bucket capacity — 4-yd.; light-materials capacity — 7-yd.

ALLIS-CHALMERS



The Model H SCOOPMOBILE with full hydraulic steering lift and bucket control is an outstanding material handler. Built for hard work, it gives top performance under all conditions. Planetary drive with 3-to-1 reduction ratio gives dependable power for all operations. Conveniently located finger-tip controls give the operator in cab full-vision command of every movement. Vickers hydraulic power steering gives positive control and lessens operator fatigue.

The versatile Model H SCOOPMOBILE with 3/4 cu. yd. scoop has rated lifting capacity of 4,000 pounds and standard dumping height of 8 feet. Quick-change attachments include swivel-type concrete hopper, lift forks, special fertilizer or hay fork, and crane boom...and make the Model H SCOOPMOBILE an efficient multi-purpose unit.

EXTRA-LOW IN INITIAL COST ... EXTRA-HIGH IN EFFICIENCY

Write for literature and name of your nearest Mixermobile dealer.

### MIXERMOBILE DISTRIBUTORS

MIXERMOBILE . SCOOPMOBILE STATIONARY MIXERS . DUO-WAY SCOOP

Box 7527



LIFT TRUCKS TELESCOPIC LIFT . STATIONARY TOWER

Portland 20, Oregon

Greencastle No. 2 crushed stone quarry, Greencastle, Ind., operated by Ohio & Indiana Stone Corp.
Greencastle limestone quarry, Greencastle, Ind., operated by Lone Star Cement Corp.
Huntington crushed stone quarry, Huntington, Ind., operated by The Erie Stone Co.
Spencer crushed stone quarry, Spencer, Ind., operated by France Stone Products, Inc.
Lehigh limestone and brownstone shale quarry, Mitchell and Brownstone, Ind., operated by Lehigh Portland Cement Co.
Winterset limestone quarry, Winterset, Iowa, operated by Penn-Dixie Cement Corp.
Superior limestone quarry, Superior, Kan., operated by Ideal Cement Co.
Bonner Springs limestone quarry, Bonner

operated by Ideal Cement Co.
Bonner Springs limestone quarry, Bonner
Springs, Kan., operated by Lone Star Cement Corp.
Fredonia limestone quarry, Fredonia, Kan.,
operated by Consolidated Cement Corp.
Iola limestone and shale quarry, Iola, Kan.,
operated by Lehigh Portland Cement Co.
Thomaston limestone quarry, Thomaston,
Maine, operated by Dragon Cement Co., Inc.
Blue Mount trap rock quarry, Blue Mount,
Md., operated by J. E. Baker Co.
Security limestone quarry, Hagerstown, Md.,
operated by North American Cement Corp.
Union Bridge limestone quarry, Union Bridge,
Md., operated by Lehigh Portland Cement
Co.

Co.
Alpena limestone quarry, Alpena, Mich., operated by Wyandotte Chemicals Corp.
Petoskey limestone quarry, Petoskey, Mich.,
operated by Petoskey Portland Cement Co.
National City gypsum quarry, National City,
Mich., operated by National Gypsum Co.
Fort Bellefontaine limestone quarry, St. Louis,
Mo., operated by Missouri Portland Cement
Co.

Co.

Marquette limestone quarry, Cape Girardeau,
Mo., operated by Marquette Cement Manufacturing Co.
St. Louis limestone quarry, Lemay, Mo., operated by Alpha Portland Cement Co.
Trident limestone quarry, Trident, Mont., operated by Ideal Cement Co.
Louisville limestone quarry, Louisville, Neb., operated by Ash Grove Lime & Portland Cement Co.

Cement Co.

LeRoy limestone quarry, LeRoy, N.Y., operated by The General Crushed Stone Co.

Auburn limestone quarry, Auburn, N.Y., operated by The General Crushed Stone Co.

Jordanville limestone quarry, Jordanville, N.Y., operated by The General Crushed Stone Co.

Chazy lime, sulfite stone and limestone quarry, Chazy, N.Y., operated by Chazy Lime and Stone Co., Inc.

Frazier limestone quarry.

co., inc.
er limestone quarry, East Fultonham,
o, operated by Pittsburgh Plate Glass
(Columbia Cement Division).

Co. (Columbia Cement Division).

Southwestern limestone quarry, Fairborn, Ohio, operated by Southwestern Portland Cement Co.

Ohio dolomite quarry, Millersville, Ohio, operated by J. E. Baker Co.

Holland crushed stone quarry, Holland, Ohio, operated by The France Stone Co.

Bloomville crushed stone quarry, Bloomville, Ohio, operated by The France Stone Co.

Bellevue crushed stone quarry, Bellevue, Ohio, operated by The France Stone Co.

Luckey lime and stone quarry, Luckey, Ohio, operated by National Gypsum Co.

Gibsorburg lime and limestone quarry, Gibsorburg limestone quarry, Naginey limestone quarry, Naginey limestone quarry, Naginey limestone quarry, Naginey

sonburg, Ohio, operated by National Gyp-sum Co.
Naginey limestone quarry, Naginey, Penn., operated by Bethlehem Steel Co.
No. 4 argillaceous limestone quarry, Nazareth, Penn., operated by Penn-Dixie Cement Corp.
Nazareth cement rock quarry, Nazareth, Penn., operated by Lone Star Cement Corp.
Fogelsville limestone and cement quarry, Fog-elsville, Penn., operated by Lehigh Portland Cement Co.
Rock Hill trap rock quarry, Quakertown, Penn., operated by The General Crushed

Cement Co.

Rock Hill trap rock quarry, Quakertown, Penn., operated by The General Crushed Stone Co.

Martins Creek limestone quarry, Martins Creek, Penn., operated by Alpha Portland Cement Co.

Nazareth cement rock quarry, Nazareth, Penn., operated by Mazareth Cement Co.

Wampum limestone quarry, Wampum, Penn., operated by Medusa Portland Cement Co.

Ormrod limestone and cement stone quarry, Ormrod, Penn., operated by Lehigh Portland Cement Co.

Northampton cement rock quarry, Northampton, Penn., operated by Universal Atlas Cement Co.

Keystone cement rock quarry, Reth.

ment Co.

Keystone cement rock quarry, Bath, Penn.,
operated by Keystone Portland Cement Co.

Bethlehem cement rock quarry, Bethlehem,
Penn., operated by National Portland Cement Co.

ment Co.
Stockertown cement rock quarry, Stockertown,
Penn., operated by Hercules Cement Corp.
Reliance "B" cement rock quarry, Egypt,
Penn., operated by Giant Portland Cement

Co. o. 3 rock and limestone quarry, West Coplay, Penn., operated by Coplay Cement Manu-facturing Co.

Sandt's Eddy cement rock quarry, Easton, Penn., operated by Lehigh Portland Cement

Co.

Billmeyer No. 2 crushed stone quarry, Mt.
Wolf, Penn., operated by J. E. Baker Co. Wolf, Penn., operated by J. E. Baker Co.
Thomasville crushed stone quarry, Thomasville,
Penn., operated by J. E. Baker Co.
Evansville cement rock quarry, Evansville,
Penn., operated by Allentown Portland Cement Co.

ment Co.

Charmian roofing granules quarry, Blue Ridge
Summit, Penn., operated by Funkhouser Co.

Montgomeryville, trap rock quarry. Montgomeryville, Penn., operated by Montgomery
Stone Co.

Martha limestone quarry, Lebanon, Tenn., operated by Marquette Cement Manufacturing
Co.

Co.

Co.

Knoxville lime quarry, Knoxville, Tenn., operated by The Standard Lime and Stone Co.

Fort Worth limestone quarry, Fort Worth, Texas, operated by General Portland Cement Co. (Trinity Portland Cement Division)

ment Co. (Trinity Portland Cement Division)

Dallas Unit No. 2 limestone quarry, Dallas,
Texas, operated by General Portland Cement
Co. (Trinity Portland Cement Division)

Dallas limestone quarry, Dallas, Texas, operated by Lone Star Cement Corp.

n limestone quarry, San Antonio, operated by Longhorn Portland Ce-

Longhorn
Texas, operated by Longhorn
ment Co.
Fordwick limestone and shale quarry, Fordwick, Va., operated by Lehigh Portland Cewick, Va., operated by Lehigh Portland Cehale quarry, Clover-

witz, va., operated by Lehigh Portland Ce-ment Co.
Virginia limestone and shale quarry, Clover-dale, Va., operated by Lone Star Cement Corp.

Corp.

[arcem limestone quarry, Gate City, Va., operated by Penn-Dixie Cement Corp.

### **Kentucky Limestone**

THE KENTUCKY Geological Survey, in cooperation with the Agricultural and Industrial Development Board of Kentucky, has published Information Circular No. 2, on "High-Cal-cium Limestone in the Kentucky Lake Area," by John A. Stokely and Eugene M. Luttrell.

The purpose of the report was to bring to the attention of the rock products and chemical industries the existence of a high-calcium limestone in the Warsaw formation in the Kentucky Lake vicinity. It is a preliminary release of information obtained in the course of a statewide investigation of industrial limestone.

The report describes the location, nature and quarrying conditions of the limestone deposit and also includes a map and chemical analyses of the deposit.

### Sand and Gravel Plant

HONESDALE QUARRY AND ASPHALT SERVICE, INC., Honesdale, Penn., has begun operation at its new sand and gravel plant at Tanners Falls, Penn. The company plans later to operate its ready-mixed concrete unit from the Tanners Falls plant. John Ferrebee is owner of the company.

### **New Offices**

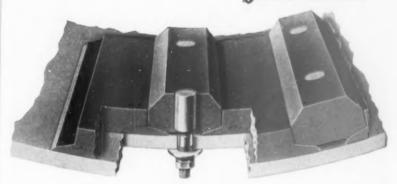
NATIONAL GYPSUM Co. has broken ground for a \$750,000 addition to its executive offices in Buffalo, N.Y. The project, which will increase the company's office space by 75 percent, is scheduled for completion in about a

The 3-story, 78- x 111-ft. addition at the rear of the present offices will provide 30,000 sq. ft. of office space, including a bomb shelter in the basement which could provide protection for 2000 people.

# When you install

# U-S-S LORAIN ROLLED PLATE LININGS

you save



Save on installation time and labor Lorain Liner Plates are made to accurate size and in easily-handled sections ... can be installed quickly and easily.

Save valuable grinding space. Because of the strength and resistance to breakage of the rolled steel from which U.S.S. Lorain Rolled Plate Linings are made. plates of reduced thickness can be used, thereby increasing the usable diameter of the mill . . . boosting output.

Save on "time out" for repairs. Close fits between ends of plates and between

plates and lift bars of U·S·S Lorain Rolled Plate Linings eliminate shell wash and allied troubles which result eventually in costly mill repairs.

Save on replacement materials. Lorain Liner Plates are so rugged they'll wear 'til they're paper thin without failing! And because the plates are interchangeable, severe localized wear at feed or discharge ends of the mill may be balanced just by reversing the worn plates to the opposite end. You get the full life of your linings when they're U.S.S Lorain Rolled Plate Linings!

There are U.S.S Lorain Rolled Plate Linings to fit any type of millfor wet grinding or dry. Available through leading mill manufacturers whose names will be furnished upon request.

### For uniform, efficient grinding action specify U.S.S GRINDING BALLS, too

• For still lower grinding costs and higher grinding efficiency, specify U·S·S Grinding Balls for your mill. They're made to exacting specifications . . . are carefully tested from raw materials to finished product to assure surface hardness and maximum hardness penetration. Available in diameters from 3 to 5". For further information end for our free booklet on U·S·S Grinding Balls.

Room 286 Pittsburg	2-Y, 525 William Penn Place 30. Pa.
Withou send me Grinding	obligation on my part, please your FREE booklet on U.S.S. Salls.
Name	
Company	
Address	

City..... State.....

United States Steel Company

UNITED STATES STEEL COMPANY, PITTSBURGH, PA. . COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. . UNITED STATES STEEL EXPORT COMPANY, NEW YORK

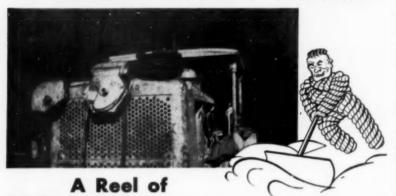
U·S·S LORAIN ROLLED PLATE LININGS AND U-S-S GRINDING BALLS



UNITED STATES STEEL

# Now...a New Tuffy

Joins the Famous Union Wire Family
To Help You
CUT CONSTRUCTION COSTS Even More!



# Tuffy DOZER ROPE on Your Dozer Can Save UP to 75%!

HERE'S HOW:—Until now, it has been necessary to throw away 40' to 50' of good rope whenever 10 feet or so have become crushed or cut on the drum. Now, you can stop this costly waste! Simply mount a reel of Tuffy Dozer Rope just back of the wedge socket... feed just enough new rope through the socket to replace only the part that is damaged! Tuffy ½" Dozer Rope is now furnished in 150' reels. Write today for simple details on how to mount Tuffy on your dozers.

These Tuffys Are TOPS in the Construction Field

Tuffy DRAGLINES Built tough—for extra flexibility, maximum abrasive resistance, easy handling, greater efficiency at high speeds or low. Easy to order—just give length, diameter and the name, "Tuffy"!

Tuffy SCRAPER ROPE Reduces material handling cost through extra yardage of dirt moved, and more days of service. And all you need to order is—Length, Diameter and "Tuffy!"



Write Today for Information

# union @ Wire Rope Corporation

and the second s			
Send Information on Tuffy:	2156 Manchester Ave.		Kansas City 3, Ma.
DOZER ROPE	Firm Name		
SCRAPER ROPE	Address		
DRAGLINES SLINGS	Class .	Zone	State
T STIMOS	City		

### FINANCIAL

RECENT DIVIDENDS			
American Rock			
Wool Corp	8 .20	April	10
Arundel CorpQ	.30	April	1
Basic Refractories,			
IncQ	.25	June	30
Basic Refractories.			
IncpfQ	1.43%	July	1
Inc.—pf.—Q	.15	June	14
Canada Cement Co.,			
Ltd61/2% pfQ	.321/2	June	20
Dragon Cement Co., IncQ	.40	June	13
General Portland Cement Co.	.50	June	30
Giant Portland			
Cement CoStk	2%	July	1
Hercules Cement Corp. Q	.25	July	1
Kelley Island			
Lime & Trans. CoQ	.35	June	30
Lehigh Portland			
Cement CoQ	.30	June	2
Lone Star			
Cement CorpQ	.35	June	27
Marquette Cement Mfg. Co.	.20	June	5
National Gypsum Co Q	.35	July	1
National Gypsum			
Co\$4.50 pfQ	1.121/4	June	2
Pacific Coast			
Aggregates, Inc	.10	June	6
Pacific Coast			
Aggregates, IncpfQ	1.12%	April	15
Peerless Cement Corp	.25	June	13
Peerless Cement CorpSp.	.121/2	June	13
Penn-Dixie Cement Corp		June	13
Pennsylvania Glass			
Sand CorpQ	.30	July	1
Pennsylvania Glass			
Sand Corp. 5% pf. Q	1.25	July	1
Permanente Cement CoQ	.30	April	30
Riverside Cement			
CoCl.A-Ac	.50	May	15
United States			
Gypsum CoQ	1.00	July	1
United States			
Commune Co - A	9. 70.00	W V	

LONE STAR CEMENT CORP., New York, N.Y., for the three months ended March 31, gives the following income account:

Gypsum Co.—pf. . . . . . 1.75 Whitehall Cement Mfg. Co. 1.00

51 1,358
1,000
7,107
9,188
0.000
5,000
2,919
\$0.59
8.597
-

FOOTE MINERAL Co., Paoli, Penn., for the quarter ended March 31, 1952, lists a net income of \$98,988, or \$0.35 per common share on 259,470 shares. For the same quarter of 1951, net profit was listed at \$165,294, or \$0.70 per share on 232,052 shares.

PENN-DIXIE CEMENT CORP., New York, N.Y., has given the following income account for the quarter ended March 31:

	1952	1951
Net sales	4.552,690	\$ 4,676,068
Costs & exp	3,534,166	3,347,814
Deprec. & deplet	260,741	192,764
Operating prof	757,783	1,135,490
Other income, net	3,943	21,470
Total income	761,726	1,156,960
Interest	9,444	1,130
Income & prof. tax.	496,500	693,000
Net income	255,782	462,830
Earn., common share	\$0.42	\$9.77
No. of common shares	602,136	602,136

GENERAL PORTLAND CEMENT Co., Chicago, Ill., for the three months ended March 31, gives the following income account:

	1952	1951
Net sales	7,193,400	\$ 6,149,300
Costs & exp	4,167,300	3,487,700
Operating profit	3,026,100	2,661,600
Other income, net	99,000	54,700
Total income	2,927,100	2,716,300
Fed. income tax	1,517,000	1,378,090
Excess prof. tax	340,000	295,000
Net profit		1,043,300
Earn., common share		\$1.00
No. of common shares	1.039.971	1.039.971

GIANT PORTLAND CEMENT Co., Philadelphia, Penn., has listed a net profit of \$166,499, or \$0.14 per share for the first quarter of 1952. This compares with a net profit of \$70,246, or \$0.07 per share for the same quarter of 1951. Net sales amounted to \$1,-172,266 for the 1952 quarter and \$945,823 for the 1951 quarter.

THE KELLEY ISLAND LIME & TRANS-PORT Co., Cleveland, Ohio, has reported a net loss of \$56,238 for the first quarter of 1952, compared with a net profit of \$63,645 for the first quarter of 1951. Net sales amounted to \$2,-406,711 for the 1952 period, as against \$2,407,158 for the same quarter of the preceding year.

NATIONAL GYPSUM Co., Buffalo, N.Y., reports the following income account for the quarter ended March

	1952	1951
Net sales	21,847,294	\$21,851,209
Cost of sales	15,556,875	14,892,572
Selling, etc., exp	2,502,548	2,021,817
Net earnings	3,787,871	4,936,820
Other income	433,947	182,940
Total income	4,221,818	5,119,760
Interest	131,832	96,677
Other deduct, net	15,857	29,538
Income taxes	2,120,000	2,350,000
Excess profits tax	325,000	680,000
Net profit	1,629,629	1,963,545
Earned preferred share	\$16.30	819.64
No. of		
preferred shares	100,000	100,000
Earned common share	\$0.68	80.88
No. of common shares	2,224,607	2,112,336

MARQUETTE CEMENT MANUFACTUR-ING Co., Chicago, Ill., has reported a net income of \$285,862, or \$0.28 per share on 850,000 shares for the three months ended March 31, 1952. This compares with a net income of \$207,-440, or \$0.20 per share on 800,000 shares for the like period of 1951. Sales for the 1952 quarter totaled \$3,901,233, as against \$3,180,092 for the 1951 period.

MEDUSA PORTLAND CEMENT Co., Cleveland, Ohio, reports sales of \$2,-930,209 for the first quarter of 1952. This was a gain of 10 percent over sales for the same quarter of 1951.

DRAGON CEMENT Co., INC., Thomaston, Maine, for the three months ended March 31, reports the following account of income:

mp, account o	a miconic.	
	1952	1951
Net sales \$ Net profit before fed, income	9,319,830.71	\$ 8,912,401.83
tax	2,236,789.16	1.841,243.02
Provision for fed. income		
tax	1,108,200.00	783,500.00
Provision for fed. excess		
prof. tax	307,300.00	119,000.00
Net profit	821,289.16	938,743.02
Earned per share—on		
170,123 shares	\$4.82	\$5.51
Earned per share—on		
225,000 shares		4.17

NORTH AMERICAN CEMENT CORP., New York, N.Y., has listed a net income of \$756,798 for the 12 months ended March 31, 1952. This compares with a net income of \$1,350,808 for the preceding 12 months.

NAZARETH CEMENT Co., Nazareth, Penn., lists a net profit of \$40,961, or \$0.26 per common share on 154,749 shares for the three months ended





Shovel and dragline load up to 90 cu. yds. of material per hr. for loading and stockpiling operations.



Back Hoe attachment digs 100° of 5° trench per hr. for handling sewer and water line work, pit drainage.

Did Nou Xuow

Bantam Shovel

Sells for less than

(Less truck and mounting charge F.O.B. Waverly, Ia.)

Includes complete shovel unit with boom, stick and % cu. yd. bucket. Price subject to change.

BANTAM® costs only a fraction of the price of bigger machines — has speed and low weight to go ANYWHERE!

Over 3000 Bantams in service all over the world prove the dependability and economy of this low cost truck-mounted excavator for handling all kinds of pioneering, loading, stockpiling, rehandling and clean-up jobs around pits and quarries. Eight fast-change Bantam attachments assure complete versatility for profitable year-'round operation. Write for the facts:

### SCHIELD BANTAM CO. 216 Park St., Waverly, Iowa

Show me how I can cut costs with a Bantam shovel.

Name Title	
Company	
City	State_ssss



World's largest manufacturer of truck-mounted Power Shovels · Cranes · Draglines



# FORGED STEEL GRINDING BALLS

- Highly impact-resistant
- Remain spherical
- Wear evenly
- Forged from special analysis steel
- Designed for efficient, economical grinding



CF&I Products for the Mining Industry
Cal-Wic Wire Cloth Screens · Light
Rails and Accessories · Wickwire Rope
Grinding Balls · Grinding Rods



THE CALIFORNIA WIRE CLOTH CORPORATION, DAKLAND
THE COLORADO FUEL AND IRON CORPORATION, DENVER and NEW YORK



FORGED STEEL GRINDING BALLS

March 31, 1952. Net profit for the same period in 1951 amounted to \$63,661, or \$0.41 per share.

PACIFIC COAST AGGREGATES, INC., San Francisco, Calif., for the three months ended March 31, 1952, reports a net loss of \$180,385, compared with a net profit of \$104,410 for the same quarter of the preceding year. Net sales for the first quarter of 1952 amounted to \$2,980,473, as against \$3,979,845 for the same quarter of 1951.

PENNSYLVANIA GLASS SAND CORP., Lewistown, Penn., for the three months ended March 31, reports the following income account:

	1952		1951
Net before taxes \$	569,970	8	732,315
Income taxes	165,987		384,529
Net profit	403,983		347,786
Earn., preferred share	\$13.03		\$11.22
Earn., common share	0.56		0.48
No. of			
preferred shares	31,000		31,000
No. of common shares	643.720		643.720

PEERLESS CEMENT CORP., Detroit, Mich., has listed a net profit of \$83,-651, or \$0.27 per common share on 310,062 shares, for the three months ended March 31, 1952. This compares with a net profit of \$152,898, or \$0.49 per share for the same period in 1951.

PERMANENTE CEMENT Co., Oakland, Calif., has reported a net income of \$870,241, or \$0.62 per share on 1,400,000 shares for the three months ended April 30, 1952. This compares with a net income of \$623,334, or \$0.45 per share for the same three months in 1951.

UNITED STATES GYPSUM Co., Chicago, Ill., lists the following consolidated earnings for the three months ended March 31:

1952	1951
Net sales\$41,661,071	\$48,239,107
Net before taxes 11,895,835	14,506,526
Income taxes 7,259,000	8,779,000
Net profit 4,636,835	5,727,526
Earn., preferred share \$59.28	\$73.22
No. of	
preferred shares 78,222	78,222
Earn., common share \$2.81	\$3.49
No. of common shares 1,599,787	1.599.787

ALPHA PORTLAND CEMENT Co., Easton, Penn., has reported a net profit of \$2,390,161, or \$4.07 per share on 586,956 shares, for the 12 months ended March 31, 1952. This compares with a net profit of \$3,490,516, or \$5.94 per share for the preceding 12 months. Net sales amounted to \$24,450,511, compared with \$22,807,904 for the preceding year.

AMERICAN POTASH & CHEMICAL CORP., Los Angeles, Calif., reports a net income of \$392,436 for the three months ended March 31, 1952, as compared to a net profit of \$657,757 for the same quarter of 1951. Earnings per pfd. share amounted to \$6.17 for the first quarter of 1952, as against \$10.00 for the same quarter of the preceding year. Earnings per A and B shares for the first quarter of 1952 were \$0.62, compared with \$1.12 for the same quarter in 1951. Net sales for the 1952 quarter totaled \$4,308,200, as against \$4,868,736 for the 1951 quarter.

### MANUFACTURERS NEWS

Oliver United Filters, Inc., New York, N.Y., has announced the appointment of E. L. Oliver, Jr., as executive vice-president in addition to his duties as manager.

Cleveland Vibrator Co., Cleveland, Ohio, has appointed Randolph L. Ruhley as resident sales engineer for the ten Atlantic coastal states from Maine to Maryland, including New York.

Union Carbide & Carbon Corp., New York, N.Y., announces that Thomas D. Cartledge has been ap-



Thomas D. Cartledge

minion Oxygen Co. Ltd., a subsidiary. Mr. Cart-

ledge joined Linde as a salesman and was assigned to a Cleveland territory. Subsequently he was made district manager in Kansas City and later held the same position in Dallas. In 1925 he was transferred to the general sales management staff in New York, and later became manager of gas sales. He served for a while as assistant general sales manager and general sales manager and in 1940 was elected vice-president. Four years later he became senior vice-president, director and a member of the executive committee.

Olin Industries, Inc., East Alton, Ill., has acquired Ramset Fasteners, Inc., Cleveland, Ohio, manufacturers of powder-actuated industrial tools. The company will continue business under its present management and will be operated by Jesse E. Williams, president, as a part of the arms and ammunition division of Olin Indus-

Hardinge Co., Inc., York, Penn., has announced the appointment of Clarence Blair Brown, Jr., to succeed Clement W. Ankeny in the Central district office, which includes Illinois, Iowa, Missouri, Indiana, Arkansas, Nebraska, Kansas, Oklahoma, and portions of Michigan, Wisconsin, Kentucky and Texas. Mr. Ankeny has been transferred to Phoenix, Ariz.

Nordberg Mfg. Co., Milwaukee, Wis., has opened a new district office in Duluth, Minn., under the management of G. E. "Gunnar" Jarpe, formerly district manager at Spokane, Wash.

Worthington Corp., Harrison, N.J., has announced the appointment of J. P. McArthur as manager of the Philadelphia district sales office, succeeding the late W. J. Daly. Mr. McArthur



"My company, in 1922 installed a Sauerman Slackline Cableway purchased from an English agent of Sauerman Bros, Inc. This plant, normally maintained, is as good today as when we bought it. Between 1932 and the end of 1951 it excavated and yielded to the hopper 2,222,783 tons and we expect it to continue producing at this rate for possibly ten more years before it is retired. I give the eapital cost divided by 18 the capital cost divided by 18 the capital cost divided by 18 the apital cost divided by 18 the apita

Mr. C. Maw, Director Stanley Ferry Gravel Co., Ltd.

# Slackline Cableway

Gravel excavation at the plant of Stanley Ferry Gravel Co., Ltd., Leeds, England, since 1932 has been a "one man, one machine" job, handled entirely by the Sauerman Slackline Cableway shown in the picture above.

During this period the Sauerman machine has moved over two million tons of gravel at a capital cost of less than one-third cent a ton, and with a nominal expense for repairs continues to give as good service as when new. The 1932 cost of the machine was lower, of course, than it is today.

The deposit is tightly packed. Water table is 9 ft. below ground level, and the gravel extends to a depth of 30 ft. The material is very abrasive. Altogether it is a tough problem.

The Sauerman machine operates on a 750 ft. span from a steel mast 90 ft. high, and soon will have taken out all the aggregate within its reach. Then the mast will be moved to a new location approximately 900 ft. from where it now stands. This will be the third move. The first pit excavated by the cableway is behind the mast in the background.

The 150 h.p. machine digs and conveys 100 tons per hour, delivering to a cantilevered hopper on the mast. A ropeway conveys the material from the hopper to the screening plant located on a highway 1,000 ft. away. The cableway could produce considerably more than 100 t.p.h., but is limited by the capacity of the ropeway.

This 19-year old installation is just one of many Sauerman installations scattered through every state in the United States and in many foreign countries that have proved wonderful long term investments for their owners, while maintaining large daily output at small expense.

For complete details and illustrations of the different sizes and uses of Saverman Slackline Cableways, write for the new, free 24-page Catalog C.

Rope Haulage Equipment **Specialists** Since 1909

### SAUERMAN BROS., Inc.

530 S. Clinton St.

Chicago 7, Illinois

KEEP **ABREAST** WITH INDUSTRY **TRENDS THROUGH** ROCK **PRODUCTS** 





"Sub-A" Flotatio



Denver Cross-Flow



Denver



Denver Super-Agitator

# Lower Cost Pumping is possible with DENVER SRL... Rubber Lined Pump



Examples of DENVER SRL Rubber Lined Pump Curves<sup>e</sup>

### Here's Why...

Power cost is 30% to 70% less than for other sand pumps on similar service. REASON: greater hydraulic efficiency resulting from simple design, rubber parts and lighter weight.

Accuracy of rubber parts results in 1½ to 3 times greater efficiency than other sand pumps.

Learn More About Actual Savings

If you pump --\s' abrasives, describe your pumping requirements. Let us study and report specific advantages of Denver SRL Pumps over pumps you now use. Write Today!



Denver Disc Filters



Denver Pula Distributor



Denver Thickeners



Reagent Feeders

### Gals. of water pe 20' head 40' head 60' head 80' head 100' head 3"×3" 100 RPM 760 1053 1303 1453 5"×5" RPM 5.4 956 8.3 1087 1000 862 1.50 RPM 1145 1385 1580 3"x3" SRL-C RPM HF 5"x4" SRL-C 850 5.4 1160 1280 800 655 890 10"x8" SRL-C 2000 RPM 48.5 610 855 14.0

(\*Multiply these horsepower ratings by the specific gravity of your pulp to determine actual brake horsepower required.)

FLOT

FLOTATION - - - - - - - ENGINEE

"The firm that makes its friends happier, healthier, and wealthier"
DENVER EQUIPMENT COMPANY

P.O. BOX 5248 . DENVER 17, COLORADO



## Slurries...handled at lower cost

The new WILFLEY MODEL K Centriugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement alurry and results in 
atepped-up production and substantial power savings. Individual engineering Write for details.

A.R. WILFLEY & SONS, Inc. Denver, Colo., U.S.A.

New York Office: 1775 Breadway, N.Y.C



WILFLEY

continue runs

PRODUCTS
FEATURES
TIMELY
INDUSTRY
NEWS
EACH

was formerly regional manager of West Coast sales and will be succeeded in this position by H. W. King, formerly manager of the San Francisco district office. P. L. McManus, formerly resident salesman in Portland, Ore., has been named to succeed Mr. McArthur at San Francisco.

Olin Industries, Inc., East Alton, Ill., announces that Dr. Fred Olsen, vice-president for research and development, has been elected president of the Industrial Research Institute, Inc., New York, N.Y.

Independent Pneumatic Tool Co., Aurora, Ill., has inaugurated a new industrial sales division of which J. A. Hill has been made manager of industrial sales; J. F. Corkery, manager of electric tool sales; and G. A. Thoma, sales promotion manager.

Hudson Pulp & Paper Corp., New York, N.Y., has announced the establishment of a free package design service for multiwall sack users. Packaging specialists will make a study of a customer's packages, sales problems and competition and then submit a design tailored to meet the user's specific needs.

The Dorr Co., Stamford, Conn., has moved its Chicago office to 610 Church St., Evanston, Ill.

Link-Belt Co., Chicago, Ill., announces that William L. Hartley, formerly sales manager at the Philadelphia plant, has been transferred to executive sales headquarters at Chicago to specialize in the application of long-haulage belt conveyors and to assist on other major engineering projects.

Dodge Mfg. Corp., Mishawaka, Ind., has announced the appointment of Fred J. Ebeling as general sales manager. He has been associated with the company since 1943 when he became credit manager. Soon after he was elected assistant treasurer and later assistant secretary and treasurer.

Hewitt-Robins, Inc., Stamford, Conn., has opened an office in Kansas City, Mo., with Robert E. Crane, field engineer, in charge. He was formerly in charge of the office in Tulsa, Okla.

W. A. Riddell Corp., Bucyrus, Ohio, has named Joseph D. Whelan as district sales representative for Washington, Oregon, Idaho, Utah, Nevada, California, Arizona and British Columbia. He will make his headquarters in California.

John A. Roebling's Sons Co., Trenton, N.J., has moved its Los Angeles district office and warehouse to the new building recently erected at 5340 E. Harbor St.

American Hoist & Derrick Co., St. Paul, Minn., has announced the resignation of Stanley M. Hunter as vice-president and director. Mr. Hunter joined the sales department in 1936 and subsequently became general manager of sales. He was appointed vice-president of sales and director in 1945 and executive vice-president in 1949.

Caterpillar Tractor Co., Peoria, Ill., has announced the appointment of Harold C. Fleming, Jr., as supervisor of Trackson ad-



Harold C. Fleming, Jr.

of Trackson advertising. He has been serving in a similar position at The Trackson Co., Milwaukee, Wis., now a wholly owned subsidiary of Caterpillar. Previously he was employed by Chain Belt Co. A veteran of four years' service in

the Navy during World War II, Mr. Fleming is a graduate of Marquette University and also attended Purdue University and the University of Wisconsin at Milwaukee.

Fruehauf Trailer Co., Detroit, Mich., has announced the appointment of James W. Pearcy as assistant to the vice-president in charge of sales. He will be in charge of customer relations. Carl H. Golm has been appointed branch manager at Saginaw, Mich.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has named A. E. Dorn as industrial sales manager of the tractor division. He succeeds H. M. Stone who has resigned to become associated with the Allis-Chalmers industrial dealership in St. Louis. L. W. Davis, branch manager at Oakland, Calif., succeeds Mr. Dorn as Pacific Coast territory manager.

The Bacon-Pietsch Co., Inc., New York, N.Y., announces that Samuel E. Johnson, Jr., has been appointed vice-president in charge of sales. Mr. Johnson, a licensed professional engineer and graduate of Newark College of Engineering, has a wide background in ship construction and power plant development. He was formerly assistant division engineer of General Electric Co.

The Babcock & Wilcox Co., New York, N.Y., has moved its general office to 161 East 42nd St., after 54 years at 85 Liberty St. Offices include the New York district sales offices of the boiler division and the refractories division.

Joy Mfg. Co., Pittsburgh, Penn., has announced the election of William L. Wearly as general sales vicepresident in charge of domestic sales, including Canada and Mexico.

Marion Power Shovel Co., Marion, Ohio, announces that John P. Courtright, president and general manager, was elected chairman of the Manufacturers Division of the American Mining Congress at its recent meeting in Cincinnati, Ohio. He was also re-elected to the division's board of governors for a three-year period.

Traylor Engineering & Mfg. Co., Allentown, Penn., announces the appointment of Douglas J. Kramm as district sales manager in charge of the Western district, with headquarters in San Francisco, Calif. He was formerly sales engineer for Allis-Chalmers Mfg. Co., in San Francisco.



Denver "Sub-A" Coal Flatation Machine



Denver Disc Filters



Denver Hydroclassifiers



Denver Super-Agitator





Denver Pula Distributor

### Improperly Engineered Dryers Result in Low Drying Efficiencies or Lost Dollars to Your Company!

DENVER STANDARD DRYERS are engineered to meet YOUR EXACT REQUIREMENTS by men who know the drying business.

Preliminary estimates on the type and size DENVER STAND-ARD DRYER required to most efficiently dry your material will be submitted promptly without charge or obligation.

No drying operation too small; too large; too simple or too complex.

**DELIVERIES.** Our selling prices are competitive and yet we make excellent deliveries—usually better than 4 months on small and large units.

Write for: Descriptive bulletins on DENVER STANDARD DRYERS. Write Today!

Many of our machines are in stock.



Denver Thickeners



Denver Jaw Crushers







NAGLE PUMPS thrive on a diet of SAND!

The wear-away action of sand-filled slurry is shear murder for pump parts. A big reason why Neal Gravel Co., Covington, Indiana, picked this Nagle 2" Type "SW" vertical pump. First, all water-end parts contacting the mixture are made of Amsco Manganese Steel, the toughest steel known . . .

you get longer wear with less servicing. Nagle's ultra-simplified maintenance design makes occasional servicing a matter of minutes. For longer uninterrupted service on "dirty" jobs write your needs to Nagle . . . for either vertical or horizontal applications.

Dewey & Almy Chemical Co., Cambridge, Mass., has elected T. T. Miller as vice-president of marketing, and George W. Blackwood as vice-president and general sales manager.

dent and general sales manager.

Hewitt-Robins, Inc., New York,
N.Y., announces the election of Benjamin T. Moffatt as executive vice-president of the company. Harold Von
Thaden, vice-president, has also been
appointed general manager of the international division in addition to the
engineers division, which he has headed for several years. Austin Goodyear,
formerly assistant general manager
of the Hewitt rubber and Robins
conveyors division, has been appointed
general manager of both divisions.

Cummins Engine Co., Inc., Columbus, Ind., has elected the following members to the board of directors: L. W. Beck, vice-president of sales; D. J. Cummins, vice-president of engineering; and W. M. Harrison, vice-president and treasurer.

Westinghouse Electric Corp., Pittsburgh, Penn., has appointed R. N. McCollom as manager of the application engineering department of the transformer division at Sharon, Penn. He succeeds C. H. Bartlett who was named manager of the division.

Sterling Electric Motors, Inc., Los Angeles, Calif., has opened a sales office in Tulsa, Okla., with B. G. Jordan as manager, to serve the state of Oklahoma. Another sales office has been opened in Buffalo, N.Y., under the management of J. W. Byrnes.





The preference for Hammond Multi-Wall Bags continues to grow steadily because of an ever-increasing list of satisfied customers in the cement, rock products and every industry where Multi-Wall Bags are used.



HIGHEST QUALITY PAPERS AND MATERIALS



MODERN MACHINERY



\* PLANT EFFICIENCY



\* PRIDE OF WORKMANSHIP

Write today for your copy of our booklet—
"To Serve You Better
with Hammond Multi-Wall Bags"

### **BAG & PAPER COMPANY**

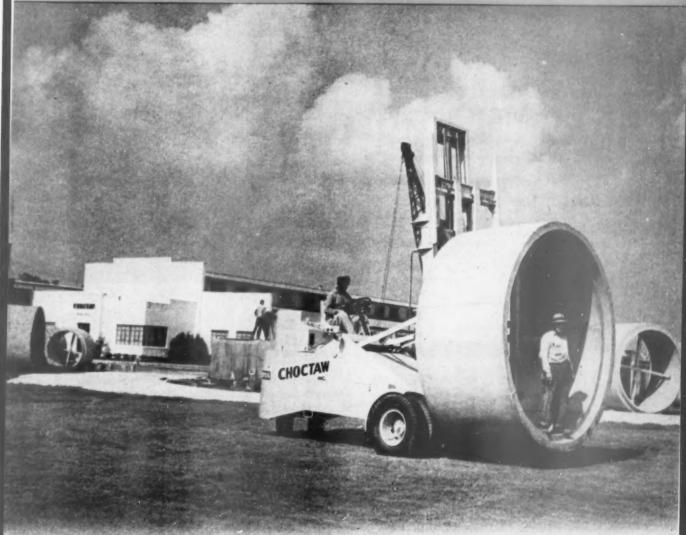
, W. Va. Plants in Wellsburg, W. Va. and Pine Bluff. Ark..

Representatives in the following Cities:

nn. New York, N.Y. Bluefield, Va. Columbus, Ohio Houston, Texas Kansas City, Mo. Baltimore, Md.

# CONCRETE PRODUCTS A SECTION OF ROCK PRODUCTS

CONCRETE UNITS. READY-MIXED CONCRETE



Handling large concrete pipe at Choctaw's Memphis plant



### Feeds easily through machine

Product manufacturers find Duraplastic air-entraining portland cement permits use of a damper mix. This results in a more cohesive, "rubbery" mix that holds together better and feeds easily through machines. Duraplastic has proved its superiority for concrete block, brick, pipe, drain tile, silo staves and other products.



corners are clean-cut and truer. Face texture is generally improved and finished units exhibit greater resistance to passage and absorption of water.

### YET DURAPLASTIC\* COSTS NO MORE

It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

OFFICES: Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

\*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.



Makes Superior Concrete Products at No Extra Cost



"THE THEATRE GUILD ON THE AIR" - Sponsored by U.S. Stoel Subsidiaries - Sunday Evenings - September to June

### INDUSTRY NEWS

### Insurance Plan Approved

NATIONAL READY MIXED CONCRETE Association recently announced that the Wage Stabilization Board has approved the association's new group insurance program, removing one of the legal obstacles that must be worked out before the plan can be put into effect (see Rock Products, June, 1952, page 191).

Other legal formalities which must still be discharged include approval

of the plan by the Insurance Department of Columbia, approval by the Salary Stabilization Board (which, in view of W.S.B. approval, is automatic), and compliance with the Wage and Hour Law and with the Income Tax Law. Also, specific approval of the insurance commissioners of Texas, Ohio and Oklahoma must be obtained before the program can be launched in those states.

### **Prestressed Concrete**

PRESTRESSED CONCRETE was the principal subject discussed at a meeting of the Muskingum Valley chapter of the Ohio Society of Professional Engineers, held recently at Marietta, Ohio. G. W. Vaught, structural engineer in Ohio for the Portland Cement Association, was the guest speaker. Mr. Vaught discussed prestressing and its advantages over conventional and reinforced concrete. He also discussed some of the latest features in panel construction for concrete walls, as developed by The Marietta Concrete Corp., and described the tilt-up sandwich type of concrete wall construction.

### **Eschenbrenner Awards**

UNIVERSAL CONCRETE PIPE Co., Columbus, Ohio, recently announced the 1952 winners of the company-sponsored Eschenbrenner awards. winners, Charles R. Burke, a senior in the engineering school at the University of Florida, and Laurie W. Seaman, an engineering senior at Swarthmore College, will each receive \$500 and an engraved medallion.

Mr. Burke's paper covered the subject "Neutral Axis Location for Reinforced Concrete Beams Near Ultimate Stresses"; Mr. Seaman's subject was titled "Hither and Thither in Prestressed Concrete." Both papers represented research done by the students during their senior year.

### Plant Opposition Lifted

OPPOSITION TO THE completion of a \$100,000 concrete mixing plant, already under construction by Walker's Ready Mix Concrete Co., at Decoto. Calif., has been withdrawn by the Decoto Chamber of Commerce which also approved continuance of the zoning provision classifying the site for light industry.

Opposition to the plant had been based on possible dust nuisance and truck-traffic hazard to pupils of a near-by school. The opposition was withdrawn after Robert Walker, owner of the company building the plant, gave assurance that the plant was being constructed so as to prevent excessive dust and that the only trucks using the plant would be driven by company employes whose driving would be under strict supervision,

MAINE CEMENT PRODUCTS Co., Veazie, Maine, has begun operations at its new concrete block plant. Present production is 6000-8000 block per day. The company plans later to add lintels, vaults and a new concrete planking material for flat roofs to its line of products.

PINELLAS INDUSTRIES, INC., is building a new plant at St. Petersburg, Fla., for the production of concrete pipe and block, ready-mixed concrete and an asphalt mix. Cost of the new plant was estimated at \$500,000. Approximately 100 persons will be employed, with an annual payroll of about \$500,000,

CHRISTY BLETNER CEMENT BLOCK Co. recently installed a new block machine at its concrete block plant in Mason, Ohio. The company plans to produce 4-, 6- and 8-in. block at the rate of approximately 1200 block per day.

QUILLIAN CONCRETE CONSTRUCTION Co., Holly Hill, Fla., has expanded plant facilities with the installation of a new concrete block manufacturing unit. The present plant has been remodeled to include a steam-curing room. Hugo Quillian is owner of the

ETERNACRETE PRODUCTS Co., Kansas City, Mo., has purchased additional property adjacent to its present site for the purpose of expanding storage facilities because of a recent increase in production. Plant capacity is approximately 11,000 concrete block per day. The company also produces joists and lintels.

R. W. DERBY, JR., and M. J. Ruddy, Jr., recently began operations at their new ready-mixed concrete plant near Modesto, Calif. Equipment includes a batching plant and three mixing trucks. The plant will be operated under the name of Allied Concrete and Supply Co.

READY MIXED CONCRETE CO., COVington, Ky., is building a new \$60,000 plant at Erlanger, Ky. Part of the former plant site has been sold to Kosmos Portland Cement Co. for barge unloading and storage facilities, and the remainder to the city of Covington for construction of a flood wall.

DAYTON BUILDERS CONCRETE Co., Dayton, Ohio, a subsidiary of Dayton Builders Supply Co., recently began operations at its new \$100,000 ready-mixed concrete plant. Officers of the new company are B. A. Wettig. president; F. E. Schouweiler, vicepresident; George Frye, secretary; and C. V. Heeter, treasurer.

Salina Concrete Products Co., Salina, Kan., held "open-house" recently, in celebration of the completion of its new office building and other plant expansion. Officers of the company are John Spaeth, president; Carl C. Engstrom, vice-president and general manager; Jack Weisgerber, secretary; and Verne Clements, treasurer. The company has been in operation since 1913 and is said to have the largest capacity of any concrete products plant of that area.



Shown above is a 26-cu. yd. bin being placed in position at the plant of Cinder Products Corp., Providence, R.I., for the storage of pumice aggregates which will be loaded in large trailer dump trucks for delivery throughout the New England area



## Better Weight Distribution Means Bigger Legal Payloads

Are you looking for a truck mixer that will give you maximum legal payloads? Then be sure to investigate the new Smith-Mobile with REAR-ENGINE DRIVE. The engine has been moved from the front to the rear of the mixer, thereby reducing over-all length by over a foot and a half. Now you can move the mixer forward on the truck and thus move the center of gravity forward to put the proper share of the load on the front axle and relieve the rear axle. This means better weight distribution, greater payloads and more take-home dollars for the owner. You can now get the best weight distribution without using Cab-Over or Cab-Ahead type of trucks. Or, you can use a shorter wheelbase truck and get greater maneuverability. Use your present standard cab type trucks and still get perfect weight distribution.

Rear Engine Drive Smith-Mobiles are built in three standard sizes: 41/2, 51/2 and 61/2 cubic yards, all bearing Truck Mixer Bureau rating plates. All of these new models have been job-tested and are backed by a company which has built nothing but mixers for 52 years.



in Overall Length

drive. This is a 51/2 yard mixer in place of a 41/2 front drive which formerly used all the space on this truck.

The T. L. SMITH CO., 2885 N. 32nd St., Milwaukee 45, Wis. U. S. A.

NCRETE MIXERS

For BIGGER and BETTER Concrete Mixers and Truck Mixers . . . LOOK TO SMITH



From the Filice & Perrelli Canning Co., Inc., Richmond, California, warehouse, an 80-case load is delivered to a terminal across the street.

## quick as a flash

Towmotor speeds from here to there, inside the plant and out, all day long. Speed handling, production, and deliveries with Towmotor fork lift trucks. For the name of your nearest Towmotor Representative and an illustrated brochure, "Handling Materials Illustrated," write Towmotor Corporation, Div. 49, 1226 E. 152nd Street, Cleveland 10, Ohio.



FORK LIFT TRUCKS AND TRACTORS

RECEIVING STORAGE . DISTRIBUTION PROCESSING

# **Blockmaster Best Buy**

FOR THIS DENVER OPERATOR

# VIBRATED CONCRETE COMPANY

DENVER S. COLORADO

April 7, 1952

Multiplex Machinery Corporation

Elmore, Ohio

We are happy to send you the enclosed Gentlemen order for our second Blockmaster machine. together with mold boxes, pallets and racks, as specified.

We want you to know that we are very much pleased with our first Blockmaster, which has been operating for six months now and has more than satisfied us. We are convinced that two of these machines will really do wonders for us

Anything you can do to speed delivery of the new machine will be much appreciated.

Vibrated Concrete Company of Denver likes fast production of top quality block because it means greater profits. It's as simple as that. Finding their competitive position so improved with their first Multico Blockmaster No. 2 (pictured above) they want another as quickly as possible.

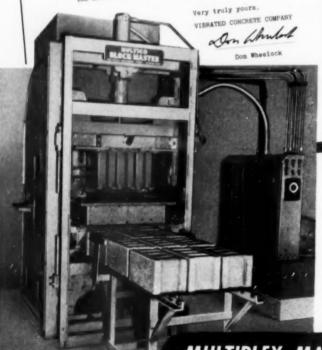
Both the Blockmaster No. 2 (2 blocks per cycle) and the Blockmaster No. 3 (3 blocks per cycle) are fully automatic machines, requiring labor only to offbear the block. They are hydraulically powered by a separate power unit which can also serve future machines. Machine action is smooth and quiet, and as the Blockmasters have 50% fewer moving parts than other machines, costly maintenance is kept at an absolute minimum.

The Blockmasters have an unbeatable compression action, producing perfect blocks. With their plain pallets they produce any size or style of block, with any aggregate.

These up-to-date, proven machines can help you too; write or call Multiplex for more information.

Multiplex Machinery Corporation has been making concrete production machinery for over 40 years. Our engineers will help you plan your plant expansion. We can show you how Multiplex automatic block machines, mixers, skip hoists, and compartment aggregate bins can make your operations more profitable.

Left: the Multico Blockmaster No. 3. Choose this hydraulically powered machine for modern, high production performance.



MULTIPLEX MACHINERY CORPORATION

**ELMORE** · OHIO





Left: Culvert pipe (100 x 50 x 30 in.) with wing pieces. Right: Culvert pipe with 64-in. span

## PIPE MANUFACTURE IN THE NETHERLANDS

Design and production methods vary widely from U.S. practice. Egg-shaped pipe extensively used for sewers; specialties include large culvert pipe

A GREAT DIFFERENCE exists between the concrete pipe industries of the U.S. and The Netherlands. In the U.S. practically only round pipe are used, while we in Holland have many types. Production methods also differ.

The most used type for sewers in The Netherlands is egg-shaped and is made under standard specification N71. These pipe have a flat bearing surface and a sharp top. Their height is 1½ times their width and the biggest width is at % of their height. This size is preferred for sewer work, as it has a narrow section when there is only a little flow. This prevents settling of solids. When the flow increases, the cross sectional area increases too.

Round pipe are also used for sewers, mostly when the N71 pipe are useless because of their greater height. But round pipe are most used for drainage and other dewatering purposes. These are made under standard specification N70 and also have a flat bearing surface and a sharp top.

In Amsterdam and some other large cities, the big sewers are laid on pile foundations. To make these foundations as simple as possible, two rows of piles are driven. A wooden sleeper is placed on each row. The concrete pipe used on this type of foundation are made under standard specification N80 and are called "Amsterdamse Profielen." Egg-shaped and round types are produced. The thickness of the sides is much greater than for types N70 and N71 and is for the purpose of placement on the sleepers. The part which on other types

### By P. F. VAN DER MEULEN BOSMA®

is the bearing surface hangs between the sleepers and prevents the pipe from being pressed off by ground or other external pressures.

All these pipe have tongue-andgroove joints and are tested according to standard specification N370. In this test procedure, the pipe is placed on two felt strips, one on each side of the bearing surface. A third felt strip is placed on the top. A hardwood block as long as the pipe, 4 in. wide and shaped to the top of the pipe, is placed on the felt. It receives the pressure from a hydraulic press. Every minute the pressure increases by 500 kg. (approximately 1100 lb.). When the specified pressure is reached, it must be maintained for 5 min. One percent of the pipe must be tested.

### **Production Equipment**

Most pipe are produced on electric or pneumatic tampers. Only a few plants used packerhead machines for round pipe. Electric or pneumatic tampers are very cheap to use, but they produce a more or less porous concrete as a dry mix must be used. This porosity is dangerous when the pipe are laid in aggressive soils, or when aggressive fluids are carried. With tampers the pipe can be guaranteed up to 50 percent above N370.

The pipe produced on packerhead machines can be much better because of a good interior finish, and the concrete is practically impervious. These units can be guaranteed up to 100 percent above N370 and often the

pipe don't fail before pressures are reached 150-200 percent above N370.

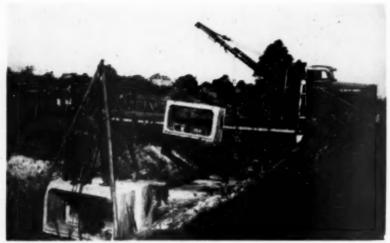
Some plants have started the production of vibrated pipe with special pneumatic or electric vibrators. This production method is very expensive and is only used when a strong, completely impervious egg-shaped pipe is needed. Freshly vibrated concrete is somewhat rubbery, but no deformations can be allowed. Therefore pipe must stay in the molds for at least one hour. This means a big investment in forms and also slows down production. Vibrated pipe can also be guaranteed up to 100 percent above N370. Vibrated pipe up to now have only been used in bigger cities and then for special purposes. Many city engineers don't like the pitted surface.

Round concrete pipe are produced in diameters from 8 to 150 cm. (3 $\frac{1}{4}$  to 60 in.) and it is even possible to go up to 220 cm. The dimensions of the egg-shaped pipe are from 25 x 37 $\frac{1}{2}$  cm. to 150 x 225 cm. (10 x 15 in. to 60 x 90 in.). The "Amsterdamse Profielen" (N80) are made from 40 x 60 cm. up to 100 x 150 cm. (16 x 24 in. to 40 x 60 in.). For round pipe of this type no special specification has been made, as these are seldom used.

Only the biggest types of pipe are reinforced with four or five rings, made of standard reinforcing steel (½-16-% in. round bars). These rings are made so that the steel is always in the stressed part of the pipe (the top and bottom of the inside and the sides on the outside). It is usual to coat the steel with a wet cement mix before placing in the form.

Practically all pipe are made with the tongue end down. The aggregate is washed gravel and sharp sand

<sup>\*</sup>Consulting engineer, Meppel, The Netherlands.



Replacing old bridge with rectangular culvert pipe. The truck crane swings the 100- x 50- x 30- in. culvert pipe ever the bridge railing and lowers it on to steel rollers on the concrete base for moving into place



A 55- x 82½- x 40-in, sewer pipe weighing 3 tons is on the left; at the right is a 20x 30-in. "TJ" pipe

dredged from the rivers Rhine and Maas (Meuse). Often, when the pipe are used under corrosive conditions, slag cement is used. In general, the best concrete is made with portland cement, but slag cement is more resistant to chemical attack.

Bell-end pipe are only used on pressure lines or other special jobs. The production methods with vibration of vertical molds or the use of centrifugal systems are practically the same as those in the United States.

Before the last war in some areas of The Netherlands, a special light type of reinforced bell-end pipe was made for use on farms and in sewer systems of villages. They were in fact clay sewer pipe made of concrete with wound cage of mild steel wire. The wall thickness of a 12-in. pipe was only 11/4 in. A very wet and sandy mix of poor quality was used. The war stopped production and 't since hasn't been resumed on a large scale. Only round pipe was made in the diameters from 4 to 32 in. Some plants could produce 40- to 50-in. and even 60-in. pipe. Their only advantages were the possibilities of making a good tight joint and their low

weight, approximately 66 percent that of standard concrete pipe.

### **Joints for Concrete Sewer Pipe**

Bell and spigot concrete pipe is not very popular in The Netherlands, although it is used to some extent in other countries in Western Europe. The tongue-and-groove pipe is much used, but compared with bell and spigot pipe it has some disadvantages. Joints are weaker and will often leak. Sometimes the sewage will leak into the soil, leaving deposits of soild matter in the line. On the other hand ground water will enter the pipeline, leading to extra expense at pumping and disposal plants. A big danger also is that sand leaks into the sewer.

The tongue-and-groove joints of the first sewers were made with cement or lime mortar. It was a cheap method, and with some settling or movement of the line practically all joints cracked. To prevent this, a new material was introduced. It is called in Dutch "moffenkit." It is a plastic butuminous material, filled with asbestos or other fibrous material. It was a big advantage over mortar, but it still had some bad points. To get some bonding to the concrete, the ends of the pipe had to be painted with a bituminous paint. This could only be done on dry pipe. But when the painted surface is wet, the moffenkit still will not stick to it.

A big part of The Netherlands is covered with a soft, sponge-like peat soil, often to great depths. This soil is easily compressed under the load of passing traffic. When a pipeline is laid in it, this line then makes about the same movements as the rails of a railroad when a train is passing.

This movement in the joints rubs the moffenkit away. Also it is often pressed out at weak points when high inside or outside water pressures develop. Cold weather application of moffenkit is also difficult. To prevent damage through these faults, a new

product was developed. It is a bandage made of bituminous felt. Application is as follows: The ends of the pipe are dried with a gasoline flame. Then a 4-6 in, wide strip is placed over the joint and through heating with the gasoline flame it bonds itself to the concrete. It is still an expensive and uncertain job to make a good sewer with these bandages. The bearing surfaces of the pipe are the weak points. They are practically always wet, the flame can't reach this area and the placing of the bandage under the joint is practically impossible. This brought many inventors into action to find better solutions.

One of these inventions was made by Mr. Huiskamp, city engineer of Doetinchem. He altered the section of the joints somewhat and pressed a circular bituminized rope in it. For this system new pallets are necessary. This is also the drawback with the "Habee" joint system, Dutch patent No. 46041. The pipe are vibrated in lengths up to 5 ft. The joints are placed on special grooved foundation block. Joints and block are filled with moffenkit, which is afterwards covered with concrete.

The best invention was made by Mr. Jarings, city engineer of Veenendaal. On three points the TJ-pipe (Dutch patent No. 65970) differ from standard pipe (see drawings, Fig. 1). TJ-pipe are made round or eggshaped, sizes beginning with the 10 in. and 10 x 15 in. diameters up to the largest. The advantages of these differences are: the alteration of the groove end (tongue end stays normal) gives a %- to ½-in. open joint on the outside of the pipe. The upper half can easily be pointed with mortar. The foot, the flat bearing area, is made 1 or 11/4 in. heavier. This enables the forming of extra %- to 1-in. deep grooves on both ends of the pipe.



Concrete pipe tamping machine manufacturing small diameter pipe

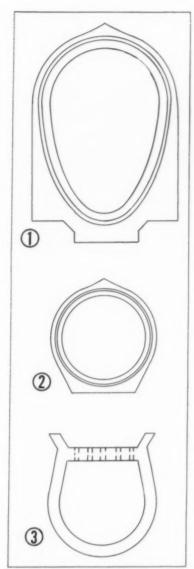


Fig. 1: Types of pipe. 1—Egg-shaped "Amsterdamse proffelen." 2—Conventional round pipe. 3—Herz drain pipe with perforations in the top surface

The groove at the tongue end is formed with an extra filling piece placed on the pallet; the other groove is made by hand. Two joint-closing pieces are also made for every pipe and are shaped to the lower half of the pipe. These pieces are grooved (1%-2% in. wide x %-1 in. deep). At the lower end the groove ends against a lip, which projects into the extra grooves of the pipe and prevents side-shifting of the closing piece. The closing pieces are made long enough to reach approximately to the widest part of the pipe.

TJ-pipe are laid on a wooden or concrete floor, or sometimes with the joints on a concrete slab. Every pipe gets some mortar in the groove and the inside of the joint is worked smooth after each pipe is placed. Dutch practice is to keep the water

content as low as possible and to use lime or trass to obtain an easy flowing mixture. In the author's opinion, use of an air-entraining agent is preferable. Nevertheless, the system employed can make joints as strong as those with unreinforced bell and spigot pipe. These stiff mortar joints are still dangerous in weak soils. Instead of mortar in the groove, a heat-resistant bituminous paste is used. The mortar is replaced by a special asphalt which is poured in at a temperature of 160-170 deg. C. For this purpose the joints are painted in the plant with bituminous paint and often only the extra groove in the tongue end is made, to save asphalt. Some ground or rain water in the joint does not harm the proper bonding of the asphalt to the concrete.

In a 12-in. pipe 3 pints of asphalt and 2 pints of paste are used. When mortar is used, 5 pints of paste are needed. For a 20-in. pipe the quantities are respectively 6 and 3 pints or 10 pints for mortar, and for a 60-in. pipe it is respectively 29-14 or 43 pints. With asphalt joints, settling, movements and vibrations can't do any harm to the sewer and it remains perfectly tight, even under 15-22 in. of water pressure.

The cost of TJ-pipe is 10-15 percent higher than standard pipe, due to the greater weight of concrete, extra labor for forming the grooves and making the two closing pieces. This greater cost is offset by the use of less expensive materials and less labor for making the joints. In many cases it also makes unnecessary the use of an underpinned foundation. These pipe can be laid very quickly, often up to 1400 ft. of standard street sewer in an 8-hr. day.

Shortly before the TJ-system came on the market, another system with the same advantages was launched. This used standard pipe, which were placed in grooved foundation block 6 to 8 in. wide. These block were in fact the grooved slabs of the Habee system, combined with the closing pieces of the TJ-system. This system was mainly used in dry, hard soils, but was soon abandoned because of the high cost of the block and the high cost of labor for their correct placing and spacing.

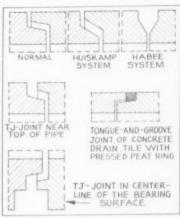


Fig. 2: Types of joints for concrete pipe

### Precautions Against Chemical Attack

In Holland only a few specials are made, but these are made in big quantities. Practically always special inlet pipe are used in sewers. These inlet pipe are made to specification N72. This specification requires that openings be made on the top center of the pipe. These openings must be 6 or 8 in. wide. For pipe diameters up to 16 in. and 12 x 18 in., a grooved collar must be made on top of the pipe. The bigger diameters have only a groove around the inlet opening. which is possible because of the greater thickness of the walls. Connections with gutters and buildings are mostly made with clay sewer pipe. These pipelines end in T or Y pieces, placed in the groove on the concrete sewer. Due to the high cost of clay T or Y pieces, at present special concrete pieces are being made. These are in fact cored concrete block. With every concrete inlet pipe a concrete cover for the opening is delivered. In sewerage systems often 10-20 percent of the pipe have inlet openings. These must have the same strength as the pipe without openings.

In streets with many connections this is often still inadequate. A new construction method was invented by Mr. Jorritsma, a technician for the city of Arnhem. It is called the "armopening" system and is used mainly for pipe up to 20 in. or 12 x 18 in.

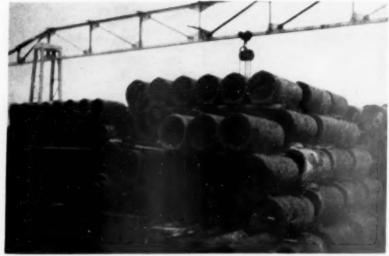


Truck crane unloading 57- x 47- x 40-in. culvert pipe weighing 2.4 tons each

diameters, the most common diameter being 10 in. One half of the required inlet is formed on the tongue end and groove end of the pipe. When the sewer is laid, a conical inlet is available on every joint. This is also used to point, clean and control the joint inside the pipe. These special openings also have some advantages when the pipe are laid. Unused openings can be closed with a concrete cover. When the openings are used, inexpensive quarter bends of clay pipe are used to make the connections. This system is patented (No. 60978).

In Holland practically no concrete bends, T, L, Y or cross pieces are made or used. In other countries in western Europe they are used to some extent. It is the Dutch practice always to make manholes at the spots where sewers join. These manholes are made of concrete units or brick.

There are several precautions against chemical attack on concrete pipe from the sewage or surrounding soil. One of the first is to make a very dense concrete with a smooth surface. Pipe made on packerhead machines and vibrated pipe are especially good. A second precaution in many cases is to use slag cement. It has more resistance against attack than standard or high early strength portland cements. Types of much used cement are:



Round and egg-shaped concrete pipe in a storage yard. Many Dutch plants use this type of crane for handling units

only possible when the joints are made with bituminous materials. When mortar is used, the joints must remain white to ensure a proper bonding of the mortar to the concrete. All systems of applying paint have the danger of air pockets and voids, through which attack starts on a small scale. When painted pipe are

Slag cement is made from portland cement clinker ground together with blast furnace slag.

These two precautions are the best possible, but are not always sufficient. Therefore concrete pipe are often dipped in, painted or sprayed with a black bituminous paint. Dipping is

3

Fig. 3: Types of inlets. 1—Inlet for small diameter pipe. 2—Inlet for larger diameter pipe. 3—The "arm-opening" system

subject to atmospheric conditions for a long time, the paint soon becomes worthless.

Before the war a big concrete products company, the N. V. Betonbouw, patented and used the Abim system of impregnating concrete products. The products, mainly pipe, were impregnated with a bituminous material in an autoclave under high pressure. This material filled all pores of the concrete and lowered water absorption from 10-12 percent to 1 or 11/2 percent. The pipe were remarkably resistant to chemical attack and other tests showed an increase in strength and abrasion resistance of a few percent. Production was stopped before the war after explosion of the autoclave and production hasn't been resumed thus far.

Some trials have been made with plastic cold glazing and other materials, but these proved to be too expensive. In Great Britain a concrete products firm makes round concrete pipe with an inner lining of a cement-graphite-glass mixture. This lining is very dense, strong and resistant to abrasion and to chemicals.

### **Culvert Pipe**

Some big concrete products companies specialize in culvert pipe. It is often a very good and profitable business. There are no specifications for culvert pipe and every plant has its own models. The dimensions of these



Placing 80- x 60-in. culvert pipe on concrete base

pipe are pretty much the same but there are more differences in weight and strength. There are three main types of culvert pipe: (1) elliptical the long axis runs horizontal, the vertical axis is  $\frac{2}{3}$  of it; (2) half round, with flat or hollow bottom; and (3) square or rectangular.

The elliptical pipe were the first special culvert pipe made in the past. Their dimensions vary from 15 x 10 in. up to 60 x 40 in., with weights varying from 400-5200 lb. per 40 in. length. These culvert pipe were not only much used for irrigation and dewatering purposes, but were also used for sewerage systems, mainly in places where only low headroom is available. They all have flat bearing surfaces. Due to their big, comparatively flat span, they must be well reinforced with mild steel rings. These rings must be placed in the stressed part of the concrete.

The high steel prices made these

pipe uneconomical, so the elliptical culverts gave way to half round culverts with hollow bottoms. These are made in spans from 40-64 in. and in weights from 1-21/2 tons. The radius of the hollow bottom is somewhat more than the span of the pipe and makes the culvert more self-cleaning. The very strong concrete sections and big, wide bearing area of these culverts makes them practically indestructible. Only a few light rings are needed to reinforce them. Their use is mainly for culverts and sewerage mains and sometimes for storm sewers. Half round culverts with flat bottoms are also made, but are only used for light loads. This type is called "Dogsties."

The above mentioned types have only wet sections up to 131/2 sq. ft. For the bigger sections the rectangular (sometimes also square) culverts have been designed. Many different dimensions are used, starting with 48 in. span x 32 in. high up to 80 in. span and 60 in. high in lengths of 40 in. For greater heights or for spans up to 100 in. the length is reduced to 30 in. Weights vary from 11/2-3 tons with 51/2- to 71/4-in. wall thickness. Maximum weight is reduced to 3 tons for normal jobs, so they can be handled with standard trucks, cranes and draglines.

All types of culverts have tongueand-groove joints. On the job, the
joints are made with cement mortar
or moffenkit, or sometimes, when a
flexible, tight joint is needed, the same
asphalt of the TJ sewer pipe is used.
When the asphalt joint is made, it is
left open for approximately ½ in.
On both the inside and outside of
the culverts a light wooden shutter
is made, into which the hot asphalt
is poured. This is often done when a
culvert is made under a canal or river,
or when settling is possible, for instance in mining areas.

For every job the maximum traffic load and fill are taken into account, and for every condition the reinforcement is changed. Loads on culverts are given in tons per square meter (one sq. m. is approximately 11 sq. ft.). For the calculation of reinforcement, the same procedure is followed as when the culvert was cast in place. When a 64-in. (1.60 m.)

span culvert 1 m. long must be tested for a load of 10 tons per sq. m., the concentrated load on the center of the span must be:  $\frac{1}{2}$  (1.6 x 10) = 8 tons. The reinforcement of a half round culvert with 60 in. span and a load of 5 tons per sq. m. is three rings of  $\frac{1}{16}$ -in. round mild steel. An elliptical culvert with the same load and span should have six rings of  $\frac{1}{3}$ -in. round mild steel.



Concrete manhole for a village sewerage system

The reinforcement of the rectangular culverts is more complex. Longitudinal bars (bars parallel to the axis of the culvert) are seldom used. When longitudinal bars are used, the reinforcement consists of an inner and an outer cage and the concrete must be vibrated. Daily output per mold is low and it takes much steel. Modern production methods require immediate release of the mold, which means that the culverts must be tamped. No longitudinal bars can be used and the reinforcement is built up of three or more rectangular rings for the outer reinforcement, and three or more rings for the inner reinforcement. This reinforcement takes both positive and negative moments, especially when the culverts are lifted.

Other bars are added where they are specifically needed and are bent into special shapes to strengthen and stiffen the edges. When three sets of rectangular rings are used it is the



Truck crane lowers a wing piece for 80- x 60- x 40-in, culvert

practice to use four sets of special bars. A culvert is tamped as follows; 5 in. of concrete are tamped on the pallets, then a set of special bars is placed. Again 5 in. of concrete is tamped and a set of rings is placed, and so on. Before placing in the mold the bars are covered with rich mortar and bar spacers are used to provide a good concrete cover. The pallets are often made of wood and also of concrete, for big cast iron pallets are very expensive, often inaccurate and difficult to obtain.

### Concrete Drain Tile

Draining fields was first begun on farms in the counties Aeeland and Groningen, which have heavy clay soils. In the years around 1850 porous clay tile with plain ends were used. These were difficult to keep in line, so the bell end clay tile were introduced. Due to the bell end, these tile needed more firing, which reduced breakage but also reduced the porosity. This meant that ground water could only enter through the bells of the tile. To get better results some

(Continued on page 138)



"TJ" sewer pipe (20 x 30 in.) with joint closing piece



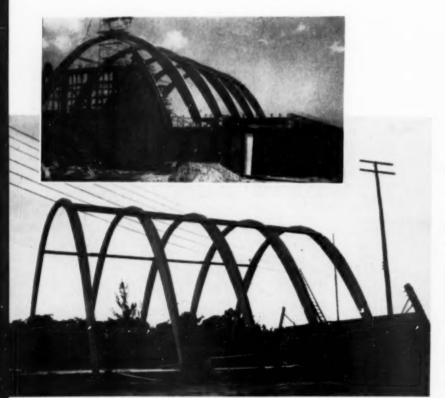
Elliptical culvert pipe, 48 x 32 in., weighs 2300 lb.



After unloading from trailers, the arches were positioned for erection



The sections, erected with two cranes, weighed about 812 tons each



The gymnasium is composed almost entirely of precast concrete, concrete masonry for the walls and the precast concrete arches

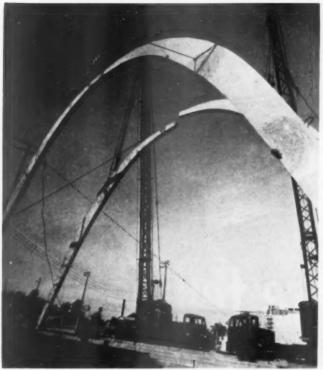
# **LARGE**

H IGHLIGHT IN THE construction of the gymnasium for the George Washington Carver school in Miami, Fla., was the use of large precast arches. Composed of beams, frames and arches, the structure was almost entirely of precast concrete.

The precast arches pictured here were manufactured by Livesay Window Co., Inc., of Miami, which also manufactures precast concrete window frames.

By using the precast units it was possible to eliminate the expensive shoring and falsework required for cast-in-place arch construction. The three-hinged arches were erected in two pieces, each weighing about 8½ tons.

The units were precast in the Livesay Window Co. plant. Only side forms were required since the 10-in.



Almost into position for bolting together. One arch is already up



The two precast arch sections in place and being bolted at the

# PRECAST STRUCTURAL CONCRETE ARCHES

thick arches were formed and concrete placed on the floor. The depth of the arches varied from 12 to 36 in.

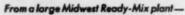
Erection and handling of the 64 ft. long sections required special care. Spanning 73 ft., at 16 ft. on centers, the two halves had to be joined by bolts at the crown which was 42 ft. above ground. The erection was handled by Poston Bridge and Iron Works Co., requiring two cranes, which lifted the arches from trailers as they were delivered to the site.

The final roof covering for the gymnasium will be of prefabricated stressed skin plywood panels bolted to the arch ribs.

The school was designed by A. B. Parker, and L. G. Farrant was consulting engineer. John Lewis is president of Livesay Window Co.



Workmen climb up the precest sections to fasten them together



"... your new design is most important development in Ready-Mix industry in years. It puts Rex way ahead of the field. Optional equipment feature makes Adjusta-Wates doubly attractive."

A New York State operator says—
"... Adjusta-Wates are everything you say they are.
Greater pay loads made possible
by rear mounting of engine and
transmission make these
machines the most productive
we've ever owned..."

# They're telling us

TELEORAM

From a West Coast operator—
"... performance of your
Adjusta-Wate machines has been
excellent from the standpoint
of quality concrete, speed of
charging and discharging, and
freedom from service delays..."

From an operator in California-

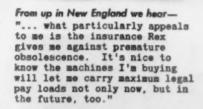
"... load distribution and design of these Adjusta-Wate machines permit us to haul maximum legal pay loads under California State Highway Laws..."

From deep in the heart of Texas-

"... we're convinced they are the finest truck mixers on the market. Expect to order additional machines soon..."

CHAIN BELT

CONSTRUCTION





# and we love it!

Honestly, we hesitated to put this story in print because it sounds so sensational . . . almost "too good to be true." But naturally, we're proud of the way the Ready-Mix Industry has acclaimed the new Rex® Adjusta-Wate Moto-Mixers®. We think everyone concerned will be interested in what users have to say about them.

The comments you see here are only a few of the many we've received . . . and more come in every day. All these successful ready-mix operators can't be wrong! So why not "get on the band wagon" yourself. Ask your Rex distributor to show you how the Adjusta-Wate can be mounted on any truck for better distribution of weight . . . greater legal pay load . . . bigger profits. He'll show you how Rex uses your "hidden treasure" to insure you against premature obsolescence. Chain Belt Company, 4649 W. Greenfield Ave., Milwaukee 1, Wisconsin.







Left: Stockpile area is paved and has concrete dividers. Each bin has a capacity of 1600 tons. Material is delivered to the stockpile by the averhead belt conveyor system consisting of an inclined conveyor from the four-way flop gate and the reversible shuttle conveyor; material is recovered by a belt conveyor running in a tunnel underneath. Right: Loading a truck mixer at the central mixing plant. Sliding funnel is lowered from the collecting hopper to the truck hatch

## **READY-MIXED CONCRETE FOR HIGHWAYS**

C-J Ready Mixed Concrete's central mixing plant designed in anticipation of developing highway business in southern Illinois

EFFINGHAM, ILL. is a town of only 6500 population, no closer than 60 miles to any city of over 50,000 population. But here is located a modern and efficient 100 cu. yd. per hr. central mixing and transit mix plant, the operation of C-J Ready Mixed Concrete. The plant is admittedly overcapacity for the population of the area, but it was built with the purpose of obtaining state highway contracts. The high quality of its concrete has enabled the company to get highway contracts many times.

Quality control has been the company's least concern. It has a very good reputation among contractors for its good control and service. One man is behind this record, according to Donald L. Moritz, plant managerthat man is the plant operator. His care, experience and knowledge of concrete is the key to consistently good concrete. Ninety percent of the reason for good concrete lies in the operator's hands, Mr. Moritz feels. The training a batching plant operator receives is obviously very important, so the company sent its operator and plant superintendent, Harry Schwerman, to the Wabash Valley Ready Mixed Concrete Association concrete school. (The Wabash Valley has changed its name to Midwest Ready Mixed Concrete Association; see the May, 1952, issue of Rock PRODUCTS, page 144).

### Plant

The central mixing plant consists of a 2½-cu. yd. Koehring mixer. The four 30-cu. yd. bins over the batcher and the 3-cu. yd. weigh batcher itself were all made by C. S.

### By L. DAVID MINSK

Johnson. Bulk cement storage is provided in a 110-bbl. bin in the middle of the aggregate bins and by an 890-bbl. silo alongside the plant. Cement is transferred from the silo to the small bin by an elevator. Materials are brought in by rail and truck. Two rail sidings have sufficient capacity for 13 cars on the aggregate track, where there is located an undertrack hopper, and for three bulk cement cars on the track adjacent to the cement silo. Two Joy electric car pullers are used to spot cars.

Seven trucks are operated by the company, five of which have Jaeger mixers and the two others 2½-cu. yd. Dumpcretes. The truck mixers are 4½ and 3 cu. yd. sizes. Bodies are washed down every night; it is a company policy to keep the trucks as clean as possible.

### **Materials Handling**

The aggregate handling facilities were designed to operate with unusual flexibility. A stockpile with five compartments formed by monolithic concrete dividers holds a total of 8000 tons of material—1600 tons in each. A 63-ft. center-to-center reversible shuttle belt conveyor runs in a gallery on top of the stockpile structure and can be used to fill any compartment. The shuttle conveyor receives aggregate from a 150-ft. belt conveyor, part of which is inclined, though the 60 ft. section over the shuttle section is horizontal.

Stone is recovered from the stock-

pile by a 185 ft. center-to-center belt conveyor operating in a 7- x 8-ft. reclaiming tunnel. The walls of the tunnel, made of reinforced concrete as is the entire stockpile area, are 10 in. thick. Two gates are located in each central pile and one in each end pile, all operated manually. Two-thirds of the stockpiles is live storage, though the paved base would make final recovery of the dead storage quite easy.

Heart of the material handling



Operator setting weights on automatic weigh



Harry Schwerman, left, plant superintendent, and Donald L. Moritz, plant manager

system, and the feature that enables one workman to unload four carloads and move 400 tons per hr., is four-way flop gate, near undertrack hopper. A short inclined undertrack belt conveyor can deliver materials either to the 194-ft. plant belt conveyor (which discharges to the bins over the batcher) or else to the stockpile conveyor, depending upon the flop gate setting. Aggregate can be delivered to the stockpile from the track hopper and simultaneously can be reclaimed from the stockpile for delivery to the overhead bins. Thus, though the system has a design load of 200 t.p.h., the total amount moving when both sections are operating is 400 t.p.h.

The entire belt conveying system can be controlled from either of two switch panels, one located near the track hopper and one at the batching plant operator's station. All plant equipment is driven by electric motors. Conveyors were made by Barber-Greene and Atlas, and belting is Goodvear.

Concrete production was continued without interruption last winter. (The plant is equipped to handle either Darex or Pozzolith admixes.) Again the management believes the record is due to the skill of the batching operator. Live steam is used for heating and bin thawing: this is provided by a 30-hp. George Otto (Springfield, Ill.) boiler with propane gas for fuel.

The entire plant was engineered, designed and constructed under the supervision of K. W. Porter, manager and chief engineer, by C. J. Moritz, Inc., contractors, Effingham. Donald Moritz is manager of C-J Ready Mixed Concrete and is a member of the board of directors of the Midwest Ready Mixed Concrete Associa-

### **Prestressed Concrete School**

THE EXTENSION DEPARTMENT of the University of Kansas, in cooperation



Over-all view of the C-J Ready Mixed Concrete plant at Effingham, Ill.; rail siding is at left



Heart of the materials handling system is the four-way flop gate (under small hopper in center). Material from undertrack hopper carried by belt conveyor at right can be transferred either to the inclined bin conveyor (top center) or to the stockpiling conveyor (at left). If material is sent to the overhead stockpile conveyor, the stockpile reclaiming conveyor (top left) can recover material for transfer simultaneously to the inclined plant conveyor. In this case, 400 t.p.h. are being moved

with the Portland Cement Association, conducted a prestressed concrete school, May 26-28. Ninety-three persons from the architectural and engineering professions and affiliated businesses were in attendance.

Speakers at the meeting included: Carlos D. Bullock, regional structural engineer, Portland Cement Association, Kansas City, Mo.; Richard R. Tipton, division bridge engineer, U.S. Bureau of Public Roads, Kansas City, Mo.; Percy F. Blair, Jr., P. F. Blair & Sons, contractors, Okla.; Ross Bryan, engineer, Bryan & Dozier, Nashville, Tenn.; Henry J. Gish, engineer, Stewart Sand & Material Co., Kansas City, Mo.; Stewart Gray, assistant vice-president, Union Wire Rope Co., Kansas City, Mo.; August R. Krehbiel, engineer, The Carter-Waters Corp., Kansas City, Mo.; Fred E. Koebel, structural engineer, Southwest Research Institute, San Antonio, Texas; and Ralph E. Spears, district structural engineer, Portland Cement Association,

Kansas City, Mo. The moderators for the meetings were Edward J. Meuller, district engineer, Gene Ellis, district structural engineer, and Mr. Spears, all associated with the west-central regional office of the Portland Cement Association.

### Solvay Reorganization

Effective June 1, 1952, The Solvay Process Division and The Solvay Sales Division were consolidated and are now operating under the name of The Solvay Process Division, Allied

Chemical & Dye Corp.

A. B. Chadwick is continuing as president and Carlton Bates as vicepresident of The Solvay Process Division. H. F. Merritt and L. B. Gordon, formerly executive vice-president and vice-president of The Solvay Sales Division, have now become vice-presidents of the consolidated division.

Announcement was also made that the executive sales offices have been moved from 40 Rector St. to 61 Broad-

way, New York 6, N.Y.



# ...with 1-SECOND GRAVITY DUMP

T takes just one second to dump a full 6-yard load with Koehring heavy-duty Dumptor. Operator trips the body release lever and gravity instantly tilts the scoop-shaped body 70°... one second later the body is empty, and Dumptor is on its way back for another load. Because there's no waiting for slowacting body hoists, Dumptor saves 15 to 25 seconds every dump. This adds up to important gains in yardage output. At 16 trips per hour on a 1,000' haul, 20 seconds dump-

ing time saved on every cycle gains 5.3 minutes more productive haul-time . . . adds 9% to hourly yardage output.

This is typical of Koehring Dumptor's basic principle . . . to reduce all non-productive time to the absolute minimum . . . and to increase work-time for more yards per hour, more profit per yard for you. Dumptor has many other cost-cutting advantages worth checking . . . see your Koehring distributor.

KOEHRING CO., Milwaukee 16, Wis.
Subsidiaries: JOHNSON • PARSONS • KWIK-MIX

CK120



# **KOEHRING DUMPTOR®**

EXCAVATORS . CRANES . PAVERS . FINISHERS . CONSTRUCTION MIXERS . MUD-JACKS®



### TON DUMPTOR STRENGTH PER TON OF PAYLOAD . . .

Layered steel-oak-steel bottom, ribreinforced body, heavily-trussed main frame provide ample Dumptor strength to stand up to severe loading shocks



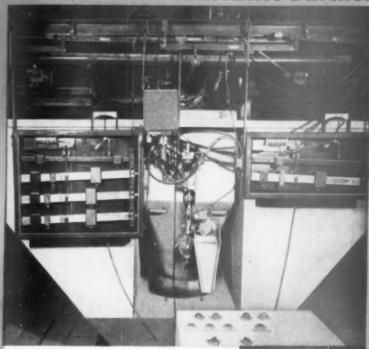
NO-TURN SHUTTLE HAUL

Koehring constant-mesh transmission gives Dumptor the same 3 fast speeds forward and reverse, eliminates slow turns at the loading unit, on narrow haul roads, and at dumping location.



NO BODY HOIST means no complicated mechanical heists to slow up how cycles, no costly heist replacement part with Keehring Dumpters. Gravity dump is always instantaneous, trouble-free

# GENTRAL GEMENT FEED with Johnson Concentric Batcher



© Central cement feed with Johnson Concentric Aggregate-Cement Batcher prevents "gumming", reduces dusting, pre-shrinks materials. All ingredients are intermingled as they flow through discharge.

© Cement, concrete's most expensive ingredient, is weighed individually on precision-beam scale in a separate batcher hung within the aggregate hopper. Aggregates are weighed on accumulative dial scale, or on individual weigh-beam scales.

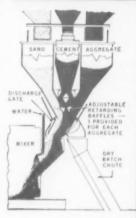
Adjustable rate of discharge of each aggregate permits accurate ribbon-feeding ... cement flow cuts off just ahead of final weight, prevents overshooting.

Dual discharge is available for charging 2 stationary mixers, or 1 stationary mixer and a truck mixer or dry-batch truck.

2 to 5 cu. yd. sizes can be arranged for 2 to 4 aggregates, plus 1 or 2 types of cement... have fully-automatic, semi-automatic or manual controls. Let your Johnson distributor show you all the production advantages you will get with one of these patented Concentric Batchers in your plant.

## Automatic AIR-RAM OPERATED

Finger-tip panel controls air rams on aggregate and cement fill valves and discharge openings provides fully gutomatic operation assures extreme accuracy at top batching speeds. Batcher also can be furnished with semi-automatic and a provider and a semi-automatic and a semi-automatic and aggregate and a semi-automatic and aggregate aggregate and aggr





C. S. JOHNSON COMPANY

(Keebring Sebsidiery) CHAMPAIGN, ILLINOIS II.



you please your customers



when you offer them a choice of CEMENT & MORTAR COLORS

Made by Williams, this is the broadest selection of fine Cement and Mortar colors on the market. By offering your customers a choice of 23 shades, you can quickly and easily settle upon one having the exact chemical and physical properties your color specification requires.

### Cement Colors by Williams

Here you have a choice of 18 shades—6 Reds, 3 Greens, 3 Browns, 3 Yellows, 1 Black, 1 Blue, and 1 Orange. Each shade is manufactured to meet the most exacting specifications for cement work-as recommended by the American Concrete Institute and the Portland Cement Association.

### Mortar Colors by Williams

Here you have a choice of 5 different shades-one shade in double strength red, light buff, dark buff, chocolate and black. Each of these colors may be used with excellent results with any standard mortar mix or with a ready-made Bricklayer's Cement.



Write today for color samples and complete nples and complete hnical information on haw Williams Coment and Morter Colors give you superior results. 10, C. K

C. K. WILLIAMS & CO. et St. Louis, III. Easton, Pa. Emeryville, Cal.



New plant of Richmond Concrete Products Co., Augusta, Ga., with cement silo at right, weigh batching assembly and block machine center, and curing kilns at left

## MAKING CONCRETE MASONRY UNITS FOR H-BOMB PROJECT

RICHMOND CONCRETE PRODUCTS Co., Inc., Augusta, Ga., placed its new concrete block plant in operation at about the beginning of the year. This is the second new concrete masonry manufacturing plant to go into operation recently in the area. The stimulation to the industry arises from the Atomic Energy Commission's Hbomb development program that centers in Aikens, S.C., across the Savannah river from the old river town of Augusta.

The new company is owned entirely by local people. President of the company is Albert Von K. Gary, who is also president of the Augusta Concrete Products Co. The latter company has an older operation that manufactures concrete pipe. It formerly produced concrete block as well, but this function has been transferred to the Richmond Concrete Products Co. operation. James N. Maples is executive vice-president and general manager of the new company and Mell Aycock is sales manager. Albert Gay is superintendent.

The new plant is located on the old Georgia belt line railroad. Like many plants in the South the plant operates with only partial cover. A Besser Super Vibrapac machine provided with electric height and uniform density control is used. Low pressure steam curing is practiced using a Cleaver-Brooks steam generator.

Bulk portland cement is shipped to Augusta from the Clinchfield, Ga., plant of Penn-Dixie Cement Corp., Alpha Portland Cement Co. and Signal Mountain Portland Cement Co. As will be seen from the illustration, the cement storage sile at the plant is elevated and two conveyors serve the Heltzel weigh-batching unit. Erickson lift trucks are used.

For the fine aggregate, sand from the Richmond Sand Co. is used. Crushed stone is from the Camak, Ga., operation of Weston-Brooker Co. and Superior Stone Co. For lightweight block production Enslite from Birmingham, Ala., is used.

### Western Masonry Meeting

THE CONCRETE MASONRY MANUFAC-TURERS ASSOCIATION held a general membership meeting at the Rodger Young Auditorium, Los Angeles, Calif., May 27. This meeting featured a general discussion on forthcoming C.M.M.A. activities. Principal topics of discussion were: (1) the association's new publication, "Concrete Masonry Review;" (2) the concrete masenry building being built for the Los Angeles County Fair, September 12-28; and (3) the association's TV program, "A Home to Live In." Each discussion leader gave a brief talk on his subject, followed by questions and suggestions from the floor. A general question and answer period concluded the program.

# Only Jaeger offers these advantages, plus light weight for biggest payloads

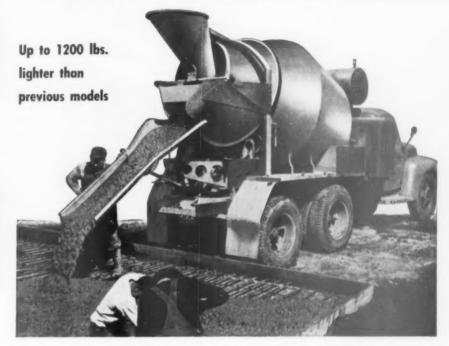


Longest life drum, fastest to charge, mix and discharge

No change in proven superior design and heavy duty construction of the Jaeger "dual mix" drum. All supporting members designed for maximum material loads.



"Swing Away" 3 piece chute
Instantly swings aside for extra big
buckets or provides 5' to 13' combinations for any condition.





Open-type end loader with instant-opening drum gate

Prevents cement blow-back or water spillage when charging and gives complete control of load.



Sealed end-loader with perfected grout-proof seal

One quick wheel-turn fully opens hopper. One push of lever lubricates and completely flushes the seal.



"Comatic" hydraulic transmission gives finger-tip control of drum

Power does the work. Automatic brake prevents shock load to transmission gears when reversing drum rotation.

You can mount Jaeger "MIX PLUS" models on any standard make of truck, haul the largest legal payload, charge, mix and discharge faster than with any other truck mixer, and continue to enjoy these advantages throughout a life expectancy of 8 to 10 years compared with the 4 to 5 years average life of cheaply built mixers that cost as much or more to buy. That's why more concrete continues to be mixed and hauled in Jaeger truck mixers than by any other method.

Get complete information from your Jaeger distributor, or write us.

### THE JAEGER MACHINE COMPANY

603 Dublin Avenue, Columbus 16, Ohio

World's largest builders of TRUCK MIXERS. AGITATORS

PUMPS . COMPRESSORS . CONCRETE MIXERS . PAVING MACHINERY

## **NEW MACHINERY**

### Fork Lift Trucks

THE BUDA Co., Harvey, Ill., has supplemented its line of fork lift trucks with gasoline model FT30-15 and diesel powered model FTD30-15. The two models are rated at 3000 lb. capacity at a 15-in. load center. Model FT30-15 is powered by Buda's four-cylinder, 49-hp. gasoline engine; the FTD30-15 is powered by a Buda diesel of the same displacement, bore, etc. as the gasoline engine. The models are available in five standard masts with a 72-, 84-, 108-, 114- and 120-in. lift.

### Intercom System

Talk-A-Phone Co., 1512 S. Pulaski, Chicago, Ill., has introduced a "job-fitted" intercommunications system, with 11 optional features designed so that a single system may be adapted to any specific requirement from a simple interoffice system to the most elaborate industrial layout. Optional features include busy signal, Redi-power, dynasonic performance, multi-stage selector, privacy handset, earphone, right-of-way relay, Hold-a-matic push buttons, silent touch bar, uni-trans and conference features.

### **Batching Control**

C. S. Johnson Co., Champaign, Ill., has developed a push button control panel that automatically produces 24 different size and type batches of

PITMAN MANUFACTURING Co., 300

West 79th Terrace, Kansas City 5,

Mo., has placed in production a new

model of the Pitman Hydra-Lift crane

with hydraulically-powered boom that

can be mounted on the frame of any

truck, 11/2 tons or larger. The unit

requires 40 in. behind the truck cab,

has a loadline capacity of 6400 lb.,

and a swinging boom which tele-

scopes from 12 to 17 to 22 ft.

**Hydraulic Truck Crane** 



Control panel features "repeater" for automatic re-batching

aggregate and cement. In addition, a "repeater" mechanism provides for uninterrupted automatic rebatching of any one selection a predetermined number of times.

The automatic mix selection mechanism is electrically controlled and is installed under the Johnson multiple compartment aggregate and cement bin. Fully automatic single material batchers on each compartment are controlled by the central dial

ment bin. Fully automatic single material batchers on each compartment are controlled by the central dial

Improvements in the new model include an increase in the unit's safety margin which was accomplished by raising about 18 in. the point on the crane's mast where the topping cable is anchored; this results in a wider angle between the boom and topping cable. Other changes are the addition of a bail bar on the topping cable and replacement of the old hammer-

head boom-tip casting with a casting

of swivel design. Lever controls have

replaced the push-pull type.



Truck crane with hydraulically-powered boom

scale unit, with pen recording of the weight of each single material batch. A cement batcher and a water batcher that provides for automatic moisture compensation completes the set-

A dial on the 24-mix selector panel provides for 2500- or 3000-p.s.i. concrete in ½-, ¾- and 1-cu. yd. batches. On each size batch there are four individual selections for 3-, 4-, 5- or 6-in. slumps.

### Cinder Crusher

EAGLE IRON WORKS, 129 Holcomb Ave., Des Moines, Iowa, has developed a three-roll cinder crusher for



Three-roll cinder crusher

concrete block plants. The unit will produce 15 t.p.h. of minus %-in. material and up to 50 t.p.h. of minus %-in. crushed cinders. It handles up to 6-in, size feed.

A large hopper and enclosed rolls prevent spillage and direct material to the crushing rolls. Rolls are made of Ni-Hard. All three are of a spring release type to pass hard foreign material without damage to the rolls.

### **Conveyor Vibrating Table**

CONCRETE MOLD AND ENGINEERING Co., P. O. Box 801, Louisville 1, Ky., has developed a heavy-duty conveyortype vibrating table designed for use



Conveyor-type vibrating table

with precast concrete products. It is 8 ft. long, 18 in. wide, and 18 in. high so that molds can be filled directly from the mixer while being vibrated. It is driven by a ½-hp., 1725-r.p.m. electric motor. The unit is equipped with Sealmaster self-aligning ball bearing pillow blocks with alemite hydraulic grease fittings on the vibrator shaft.



Hi-Boy TRUKMIXERS

are Standard, Complete Heavy-Duty Models

3-cu. yd. Hi-Boy weighs 5580 lbs.  $4\frac{1}{2}$ -cu. yd. Hi-Boy weighs 6830 lbs.

Ask about the

26 FEATURES THAT ASSURE
BIGGER PAYLOADS HIGHER PRODUCTION
LOWER MAINTENANCE BETTER AND
EASIER OPERATION GREATER EFFICIENCY

BIAW-KNOX

BLAW-KNOX DIVISION

of Blaw-Knox Company
Farmers Bank Building, Pittsburgh 22, Pa



Light weight is important, BUT . . . it takes a complete, standard truck mixer to handle every ready-mix job that comes along, and at a profit. The heavy-duty Hi-Boy is the lightest weight complete truck mixer on the market! Dead weight is eliminated, yet the Hi-Boy retains all the features and sturdy construction for peak performance that have made it first choice for so long, on so many jobs that call for big production at low cost.

With the lightweight Hi-Boy, you're sure of bigger payloads at lower cost per yard . . . and you have a heavy-duty truck mixer at a lower capital investment. For example, the 3-yd. Hi-Boy can be mounted on a single rear axle chassis of proper wheel base capable of carrying 18,000 lbs. total load, without exceeding legal limitations for weight on the rear axle.

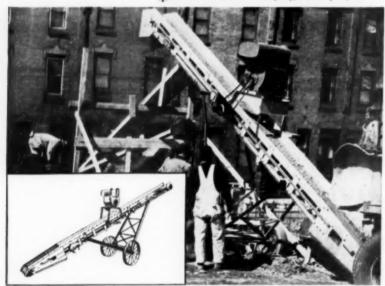
It will pay you to get the low-down on the Hi-Boy today. Your Blaw-Knox distributor will give you complete details.

Check the advantages of the BLAW-KNOX "Complete Package" of Ready-Mix Equipment

Now you can get all your ready-mix equipment in one "Complete Package" . . . clamshell buckets, mixing, batching and charging plants, and Mi-Boy Trukmixers . . . ell on one order, with just one financial arrangement and backed by one undivided responsibility. You have one competent distributer source for expert repair and maintenance, and prompt service on parts. Ask your Blaw-Knox distributor to explain every benefit of the "Complete Ready-Mix Package".

# FARQUHAR CONVEYOR SAVES \$125 A WEEK ON CONSTRUCTION JOB\*

Kat M & L Construction Company, Philadelphia, Pa



THIS Farquhar Conveyor, used by the M & L Construction Co., unloads 6½ cubic yards of wet concrete in 10 minutes, direct to forms. On one job alone, it saved the labor of two or three men—saving \$125 a week, and quickly defraying the Conveyor's initial low cost of \$1200. In addition, costly runways, scaffolding, buggies and wheelbarrows were eliminated!

Whether you move coal, gravel, sand, aggregates, cartons, boxes, bundles, bales, or any kind of bulk or packaged materials—horizontally or from floor to floor—Farquhar can cut your handling costs to rock bottom! One or more of the complete line of Farquhar portable, semi-permanent and permanent conveyors will solve your handling problem. Our engineers will be glad to consult with you . . . at no obligation!



FREE! "Owners Report"
... a booklet of case histories of money-saving conveyer installations.
Write for your copy today:
A. B. FARQUHAR CO.,
Conveyor Dept. U-28, 142 N. Duke St.,
York, Pa., or 618 W. Elm St., Chicago 10, III.

WORLD'S MOST COMPLETE
CONVEYOR LINE

A. B. FARQUHAR COMPANY Division of THE OLIVER CORPORATION

### **Netherlands Pipe**

(Continued from page 125)

new types of drain tile were made in concrete. At first, tile with a porous top and a bottom part of concrete were produced. This system was not very successful.

A more specialized type was made by the Herz system, which was used on several big jobs. This system was patented in Holland under no. 29629 and consists of a horseshoe-shaped bell and spigot pipe with a flat top. This top is made like a gutter which is filled with gravel or other filtering material. The collected water drips through perforations into the pipe, which is made of normal, dense concrete. The Herz-pipe were in lengths up to 40 in. and in several diameters. They were produced by Van Waning of Rotterdam.

In Germany and other countries in Western Europe, standard concrete pipe with perforations in sides and top are also used. In the years before 1939, Trip of Utrecht developed a porous concrete drain tile, which was patented under no. 48210. A revolutionary novelty was the introduction of the pressed-peat ring to seal the joints. This prevents the entrance of soil and roots in the drainline. These drain tile and pipe are made in lengths of 13-30 in. in bell and spigot and tongue and groove types. On both types the pressed-peat seal is used and is placed either in the bell of the tile or around the tongue. The 2 in. and 2% in. diameters are made in 13 in. lengths and with bells weigh 51/2 and 61/2 lb., respectively. The 31/4 in. and 4 in. diameters are made in 20 in. lengths. The bell end types weigh 8 and 10 lb. respectively. Tongue and groove pipe (6 in. dia.) are made in lengths of 24 in., weighing 48 lb. The 8-, 10-, 12- and 16-in. tongue and groove drain pipe are made in 30 in. lengths weighing 100, 125, 170 and 275 lb., respectively.

The tile and pipe are made on special jolting machines. One big machine has a production of more than 2000 13-in. tile per hr. This machine has practically the same appearance as a bottle-filling machine. The porosity of the pipe is approximately 30 percent of their volume, but their strength exceeds the test for standard sewer pipe, often by 50-75 percent. Their life expectancy in good soil is still unknown, but it is expected to be many years. Millions of these tile are used in the Noord Oost Polder, the reclaimed eastern part of the Zuyderzee. This area was made dry during the war, but cultivation started on a large scale only after the liberation. A special concrete drain tile plant was built in the center of the "Polder" near the town of Emmeloord.

BEATRICE CONCRETE Co., Beatrice, Neb., has purchased the plant and equipment of Redi-Mix Concrete Co., formerly owned by William Haith, also of Beatrice.



### PROFIT BY:

- GREATER LEGAL PAYLOADS
- BETTER WEIGHT DISTRIBUTION
- GREATER PHYSICAL LOADS OF CONCRETE

Your truck and mixer combination, for greatest efficiency and operating profit, should work together as a team, each supplementing the other, the size mixer being selected with due regard for the load carrying and performance qualities of your truck chassis. There is no profit in over- or under-loading your truck. When it has the ability to carry a Challenge 3½ or 4 yard Mixer, why take less...or when it will carry a Challenge 5 yard Mixer,

why settle for a 41/2 yard mixer?

Each size Challenge Mixer, working as a team with the proper size standard, factory-built truck, will carry a full-rated payload of concrete on inspection jobs.

With more than 14 years truck and truck equipment manufacturing experience, Cook Bros. and C-B dealers can advise you on the most profitable size Challenge Mixer for your truck...get the facts, TODAY!

### Are You Operating the RIGHT Truck and Mixer Combination?

Cook Bros. engineers or your nearest C-B Dealer will analyze your truck unit with the existing weight laws of your state. Forward on your company letterhead, complete information...make, year, and model truck; type front and rear axles; and whether it will be used mostly for an or off the highway work.

Your inquiries are invited...there's no obligation

\*Truck Mixer Manufacturers Bureau



1815'No. Broadway, Los Angeles 31, Calif. Telephone: CApitol 2-9111

Cook Bros. Dealers

Denver, Colorado

Mobile, Alabama
ANDREWS EQUIPMENT SERVICE OF
WASHINGTON, INC.
Spokane, Washington

J. W. BARTHOLOW MACHINERY CO. Dallas, Texas

JAMES W. BELL CO., INC.
Cedar Rapids, Iowa
GIL BOERS EQUIPMENT CO.
Chicago, Illinois

BOGIE EQUIPMENT CO.
Louisville, Kentucky
BUCHANAN EQUIPMENT CO.
Kansas City, Missouri

J. W. BURRESS
Roanoke, Virginia
TOM W. CARPENTER CO., INC.
Amarillo, Texas

CLARK EQUIPMENT COMPANY, INC.
Little Rock, Arkansas
CONTRACTORS SERVICE, INC.
Charlotte, No. Carolina

HARRY CORNELIUS COMPANY
Albuquerque, New Mexico
CREDLE EQUIPMENT, INC.
Utica, New York

DOW & COMPANY
Buffalo, New York
DUNHAM-PUGH COMPANY, INC.
Baton Rouge, Louisiana

Baton Rouge, Louisiana
ENGINEERING SALES SERVICE, INC
Boise, Idaho
EQUIPMENT INCORPORATED

Jackson, Mississippi EQUIPMENT SUPPLY CO., INC. El Paso, Texas

FEHRS TRACTOR & EQUIPMENT CO.
Omaha, Nebraska
FLESCH-MILLER TRACTOR CO.

Lawrence, Indiana
FLORIDA MACHINERY CORP.
Miami, Florida

PRANTZ EQUIPMENT CO.
Philadelphia, Penn.
FRANTZ TRACTOR CO.

New York, New York
FREE STATE EQUIPMENT CO.
Baltimore, Maryland
GRACE BROTHERS, LTD.

Honolulu, Hawaii
HEDGE & MATTHEIS CO.
Boston, Massachusetts
MANEGOLD EQUIPMENT CO.

Detroit, Michigan

MILWAUKEE POWER EQUIPMENT CO.

Milwaukee, Wisconsin

MINE & CONTRACTORS SUPPLY CO., INC.

Birmingham, Alabama
MISSOURI CONTRACTORS EQUIPMENT CO.

St. Louis, Missouri
H. H. HIELSEN COMPANY
Salt Lake City, Utah

OLSEN EQUIPMENT CO.
Minneapolis, Minnesota
JOHN W. PATTERSON CO.

Carnegie, Pennsylvania
THE VICTOR L. PHILLIPS CO.
Oklahoma City, Oklahoma
STATHAM MACHINERY & EQUIPMENT CO.
Atlanta, Georgia

Memphis, Tennessee
W. T. WALSH EQUIPMENT CO.

Cleveland, Ohio
WEST VIRGINIA TRACTOR & EQUIP. CO.
Charleston, West Virginia

POCKY MOUNTAIN EXPORT CO.
Denver, Colorado



### FORUM

ON CURING
CONCRETE PRODUCTS

### Question

We are building a new set of steam curing kilns for our block production, and we have been told that to obtain best results, we should install a drainage system that will allow draining off the water in each kiln during the steam curing process.

Each kiln would have a drain outlet in the center of the kiln (lengthwise), and through outside valves, water could be withdrawn from each kiln as desired.

Since we have not as yet begun construction of these kilns, would you please tell us if we are well advised to carry out this procedure?

### Answer

You have been badly advised. In our travels over the United States we have had this same question brought to our attention a number of times.

If a drainage system were installed and in place, it would be best to plug up the outlets during the curing cycle and open the drains only after block have been removed from the kilns. We are decidedly against the idea of draining water from kilns during the steam curing cycle, and we will explain most fully our reasons for this. Under normal operation, for a kiln

Under normal operation, for a kiln holding 1500 standard 8-in. block, during the steam admission cycle there would be thrown into the kiln over a period of four to five hours between 3750 and 4500 lb. of steam. This steam condenses to water, which covers all exposed surfaces in the kilns. These include block, racks, pallets, roof, sides and floor of kiln. Generally about 1500 lb. of water stay on the block and the balance of 3000 lb. settles all over the kiln floor.

(Continued on page 143)



# OSWALT SERVICE has increased our block output 50%!"

That is what vibrapac owners are saying everywhere . . . after they have had their machines boosted from 600 to 900 blocks per hour in capacity with Oswalt Service. The extra production without sacrifice of quality means additional profits of at least \$60.00 per day.

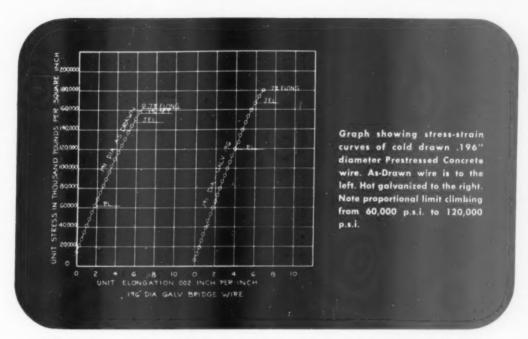
Many satisfied customers operating over 70 machines

Write today for our New BULLETIN Ask for name of Oswaltserviced plant near you

OSWALT ENGINEERING SERVICE CORP.

1335 Circle Avenue, Forest Park, III. Phones: EStebrook 8-3666 — FOrest 6-3898

# PRESTRESSED CONCRETE



# Why you should use hot-dipped galvanizing

SURFACE PROTECTION is not the chief reason to specify hot-dipped galvanizing on your post-tensioned Prestressed Concrete projects. It's true that this method gives the best protective coating against corrosion. More important, however, hot-dip galvanizing of the acid steel relieves the wires and raises their elastic properties considerably above those of cold drawn wire.

This wire permits the use of design-tension stress of 120,000 p.s.i. Used at this value, you are always working in the elastic range of the wire itself. And we can guarantee absolute stability with no relaxation of the street...your assurance of safety for the life of the structure.

Each length of Roebling Prestressed Concrete Strand is made into an assembly at the factory with the use of specially designed fittings. Each fitting develops the full breaking strength of the strand without exceeding the yield point of the material in any part of the fitting. Each assembly is then proofloaded in excess of the recommended design-tension stress.

At the construction site the use of an inexpensive hydraulic ram brings the strand assemblies to stress in minutes, cutting the on-the-job labor costs to a minimum. And you never need worry about costly take-ups either.

Strand for post-tensioning is just one of a full line of Roebling Prestressed Concrete products. Wire and strand for pre-tensioning are made of high tensile acid steel that results in exceptionally high elastic characteristics. They are specially treated to greatly increase their bonding quality, too.

We manufacture our own prestressing materials. We know they will deliver all we promise and more. Get the facts and figures on Roebling Prestressing materials. Write Prestressed Concrete Department, John A. Roebling's Sons Company, Trenton 2, New Jersey.

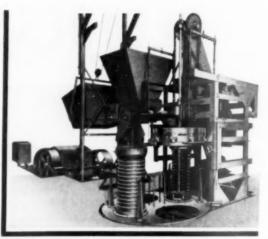


Roebling Prestressed Concrete Strand and its specially developed fitting which are available in a complete range of sizes from 5%" to 1-9/16". With an inexpensive hydraulic ram, assemblies such as these can be brought to stress in a matter of minutes.



# You Can't Match McCracken FOR CONCRETE PIPE PRODUCTION

- 1. Doubles production in all sizes 4" to 36".
- 2. Handles 90% of suburban market-80% of metropolitan market.
- 3. Does twice the business with half the inventory.
- Makes all the sizes in which machine-made production and fixed-plant operation offer any real economy:
- Produces quality pipe to meet all requirements with liberal margin of safety.
- Reduces cast from 50% to 10%-50% on the 6" size down to 10% on the 36" size.
- A wide range of sizes with lowest costs in every size it makes.
- 8. More resales—you can't sell a lemon to the same man twice.



MODEL "T" (Pictured Above)-4" to 36"; MODEL "R"-4" to 18"; MODEL "D" for Drain Tile-sizes 4" to 16"

WRITE FOR COMPLETE INFORMATION TO DEPT. CPS at any of the following addresses:

Eastern Representative Harry E. Amar 211 East 149th St. New York St. N. Y. Central & South American Agent George W. Hoffmann Apartado Postal 1173 Mexico, D. F.

MAIN OFFICE AND FACTORY, SIQUE CITY, IOWA



# STEEL SHORT! · · · PROFITS LONG!



SUPER LINTELATORS
Make lintels 7%" HIGH by
3%" 5%" 7%" 9%" 11%"
WIDE in these lengths.

5 6 2'8" up to 6' 5 7 2'8" up to 7'4" 5 8 2'8" up to 8'8" 5 9 2'8" up to 9'4" 5 10 2"8" up to 10'8" STANDARD LINTELATORS Make lintels 7%" HIGH by 3%" 5%" 7%" WIDE in these lengths.

lengths.

No. 6 ... 2'8'' up to 6'

No. 7 ... 2'8'' up to 7'4''

No. 8 ... 2'8'' up to 8'8''

No. 9 ... 2'8'' up to 9'4''

when you MAKE and SELL
 CONCRETE LINTELS and SILLS

Popular KENT LINTELATORS are economically producing lintels and sills in various lengths and sizes which satisfy the increasing requirements of builders everywhere.

With steel difficult to obtain there is an even greater than normal demand for these proven products.

Then, too, their lower "on the job" installation cost is a big factor to the builder, resulting in a greater ultimate profit to him.

Don't let another day slip by without getting the complete facts and figures on KENT LINTELATORS.

Write at once for the bulletins.

Lintelators are available with special motor driven mechanical vibrators which reduce noise,

The KENT MACHINE CO. Cuyahoga Falls, Ohio Machinery Since 1925

Assuming that the block at the end of the steam admission cycle have reached a temperature of 150 deg. F., this mass of 3000 lb. of water on the floor and walls contains a total of 450,000 B.t.u. of heat energy. This amount of heat is roughly the equivalent of what might be obtained from burning 3 gal. of fuel oil. It is definitely a substantial quantity of heat and contributes materially to maintaining the heat of kilns and block.

If this amount of water were drained off, slowly, or all at once, it would make it necessary to replace the loss of its heat by admitting an additional quantity of about 500 lb. of steam. Translating this figure into extra fuel required, it would amount to 5 gal. of fuel oil more. In actual extra cost, with oil at 13 cents per gal., it would be 65 cents for 1500 block, and for a daily production of 7500 block would amount to \$3.25. On the basis of 250 days operation per year, the additional fuel cost would be \$812.50.

While this additional unnecessary fuel expense item is not a major consideration, nor a matter of real concern, there is introduced another disturbing element of far greater harmful influence. Through eliminating the greater part of the condensed steam in the form of water on the floor, through kiln drains, we create a condition that of itself presupposes a lower humidity in the kiln atmosphere. Reducing and lowering the humidity in kiln atmospheres harms the block undergoing the curing cycle.

The relative humidity in all kiln atmospheres should be as close to 100 percent saturation as possible. In this case, the vapor pressure of water vapor in the kiln atmosphere is as great as the vapor pressure in the block and no transfer of water takes.place from kiln atmosphere into block or from block into kiln atmosphere (this does not cover condensation of moisture on block).

However, when through lack of water in the kilns, the humidity of the kiln atmosphere becomes markedly less than 100 percent, kiln vapor pres-

less than 100 percent, kiln vapor pressure drops to a point where it is less than the vapor pressure in the block, and water leaves the block and enters the kiln atmosphere. This phenomenon becomes accelerated in great measure as block temperatures increase and approach 170 deg. F.

Block become ruined when water in them is pushed out before the cement hydration process has been completed.

Thus, there is no advantage of any kind in draining off water from kilns during the steam curing process, and it should never be done.

# Company Formed

EDWARD PAYNE, INC., is a new concrete and building materials company recently established at Sabina, Ohio. The plant, managed by Fred S. Grant, will produce concrete septic tanks, lintels and other concrete products.



Electric resistant welding machine installed at new plant for producing wire mesh for reinforcing concrete products

# Electric Resistance Welded Mesh

IVY H. SMITH Co. recently began production of electric resistance welded mesh for concrete products at its new plant in Jacksonville, Fla. Plant capacity is about 1000 tons per month, on a single-shift basis. The product, consisting of No. 0 to No. 10 mesh in widths up to 8 ft., will be sold to producers of concrete pipe and slabs in the southeastern states.

A steel frame building with walls of corrugated galvanized sheets, affording 15,000 sq. ft. of floor area, was erected for the new mill. Equipment includes four Morgan wire drawing blocks and the latest design of electric resistance welding machine, supplied by National Electric Welding Machine Co.

Twelve men are employed at the new plant. All handling is done mechanically by overhead crane and fork trucks. The raw material used is 11/32 in., 9/32 in. and No. 5 wire rod, which is drawn down to the required sizes for mesh.

Ivy H. Smith, owner of the plant, is also president of Sherman Concrete Pipe Co., Jacksonville, Fla., and was recently elected president of the American Concrete Pipe Association.

# Bridge building THE WILLARD WAY



Weigh Batch Loader and Loading Conveyor load and batch aggregates from several locations along eighty mile stretch of Mohave desert. Batches are hauled by two batch trucks to one of the forty-eight bridges along the lengthy job.

Again—the right mix at the right place at the right time and at the right cost.

Write for the "Willard Way" Booklet.

# Willard Concrete Machinery Sales Company

11700 Wright Road, Lynwood, (Los Angeles County) California







Effective, all-directional vibration for moving stubborn materials toward hopper outlets. And when attached to concrete forms or molds, the VIBROLATOR will eliminate voids and give a smooth surface. Whatever your vibrator requirements, there's a Peterson VIBROLATOR to lit the job and do it more efficiently.

WRITE for complete description, installation data and sizes -

ENGINEERING COMPANY
KEWANEE 4, ILLINOIS

# ★STAR. THREADED SOCKETS

Specially designed inserts for the precast concrete industry.

Sturdy, non-corrosive metal, perfect threaded units, positive anchorage.

Special Assemblies for Park Benches, Steps, Fence Posts, Vaults, Septic Tanks and other concrete products.

STAR EXPANSION PRODUCTS COMPANY

149 Cedar St. New York 6, N. Y.

SECURITY
BONDS

Rugged, effective vibration

without damage to your bins and hoppers when you use the patented Peterson pneumatic VIBROLATOR. ROOF TILES OF

HIGHEST QUALITY . . .

BEAUTIFUL COLOURS.

PRACTICAL COST . .

NAIL HOLE PIERCING PUNCHES MIXED MATERIAL HERE TRIN DISCHARGE RAILS

.. WITH THE Roof Tile Making Plant

Distributors wanted in certain territories.

Many users of the Adams-Powel Concrete Roof Tile Making Plant have redeemed the entire cost of the installation within 12 months operation. Up to 5,000 tiles can be produced per hour. Many customers have as many as eight complete plants. Write for further details to Manufacturers

ANGLO-SCOTTISH TOOL CO. LTD. GATESHEAD II, ENGLAND

# Low in Cost — Large Capacity "THE ROCKET"

The Latest Development in Revolving Drum

Separate **Engine Drive** or Power Take-Off Hydraulic Drive Fast to Charge,

Mix and Discharge. 41 THE MIXER AGITATOR



Has Hydraulic Swing Shute Illustrated Bulletin on Request

4987 FYLER AVE. . ST. LOUIS 9, MO.

Serving the CONCRETE INDUSTRY OVER 20 YEARS

# Roduce MATERIALS HANDLING COSTS Install "BRANFORD" AIR VIBRATORS

To promote free flow of materials through hoppers, bins, screens and other material handling equipment.

# Eliminate DESTRUCTIVE POUNDING!

on sand hopper.



Economical to operate—easy to install. Sizes available to

Send dimensional data-nature of material, etc. for our recommendations.

Catalog on Request



MANUFACTURED BY **NEW HAVEN** VIBRATOR COMPANY **SINCE 1915** 

145 CHESTNUT ST., NEW HAVEN, CONN.

# CLASSIFIED ADVERTISEMENTS

CRUSHERS-SCREENS-CONVEYORS CONVEYOR PARTS-SCALES-FEEDERS

**Guaranteed Equipment - Immediate Shipment** 

CINDER, PUMICE, PERLITE CRUSHERS



VIBRATING SCREENS

Heavy duty eccentric shaft types, 1 to 5 decks; screen sizes to 5x14. 4 double-roll, self aligning scaled bearings. Priced from \$1494.00 includ-ing cloth or plate.



10 to 20 tons per hour capacity \$ 479.00 25 to 50 tons per hour capacity 1144.00 50 to 100 tons per hour capacity 1483.00 Complete with hoppers.

### PAN AND RECIPROCATING FEEDERS

Complete with motor and drive. 15 to 225 tons per hour capacity. ..... \$423.00

### TRUCK SCALES

20	Ton	Truck	Scales													\$617.0
26	Ton	Truck	Scales										9			684.0
		Truck														
		to 50 t														
wit	h st	ructura	I nteel. 1	Pa	21	B	a	nd	ŀ	w	el	g	th	ıŝ	n	g beam
Ø	#F007 4 11	of make	A -		-		4-		-1		-		. 1	-	_	_



Eccentric weight type screens, 1 to 3 decks; sizes to 3' x 8'. Including cloth or plates, from \$431.00.

# BUILD YOUR OWN CONVEYORS AND BELT FEEDERS



3-roll Troughing Idlers	
14" belt 816,50	24" belt\$18.7
16" belt 17.25	30" belt 19.50
18" belt 18.00	36" belt 20.21
42" belt	\$21.00
1-roll Return Idlers for	
24" helt \$7.50	36" belt \$8.71
30" belt 8.25	42" helt 9.50
48" belt	
All steel. Interchanges	able with other well
known makes. Replaces	able ball bearings. No

bearing adjustments required. Easy to start and will run in cold weather. Rust-proof ball races; maintenance is negligible.

# HEAVY DUTY FLIGHT CONVEYORS

Any length. Flights up to 8" x 24". All welded structural and sheet steel. Heavy duty, double guided chain. Priced from \$571.00

# PORTABLE CONVEYORS

Flat belt, troughing, and flight models. Tell us



All welded steel. With or without frames. All sizes. Hend pulleys in frame from \$154.00. Takeup pulleys in frame from \$189.00.

# GRAVITY TAKEUPS



All sizes, welded steel frame & pulleys. Complete from \$406.00.

A. C. & D. C. MOTORS - DRIVES - CONVEYOR BELTING - CHAIN - SPEED REDUCERS - BEARINGS

WE HAVE MACHINERY FOR LIGHT-WEIGHT AGGREGATE, EXPANDED CLAY, AND PLANTS PROCESSING VOLCANIC AND OTHER NATURAL CINDERS.

More than 3500 mines and quarries have modernized with Bonded equipment. WRITE FOR COMPLETE CATALOGUE AND PRICE LIST OF TRADEINS, DEMONSTRATORS, AND REPOSSESSIONS. REBUILT AND WITH NEW EQUIPMENT GUARANTEES

### SCALE & MACHINE COMPANY

PHONES GArfield 2186; FRenklin 5-8898, Evenings.

**BULK-CEMENT BINS** AGGREGATE-CEMENT BINS CEMENT CONVEYING SCREWS WEIGH-BATCHING EQUIPMENT **CEMENT-AGGREGATE ELEVATORS** 

L. K. LIPPERT COMPANY

212 E. 1st St. (phone 18) LONDON, OHIO

# FOR SALE MOVE BULK CEMENT BY AIR

Robinson 50 ft. Air Activator with Sullivan 210 ft. 2 stage Air Compressor including piping and controls for moving bulk cement. Ideal for concrete products on a ready-mix plant. We used this equipment on one job lasting only 8 months and have no further use for same. We paid \$4,825 and our asking price is \$3000. Equipment at present stored in our yard.

> KELLY CORPORATION Forest St. Place, Arlington, Mass.

# FOR SALE

- 1-Besly Double Spindle Dry Concrete Block Grinder: Serial No. 630-42 PO 11
- 2-42" Steel Disk Wheels
- 2-40 HP, 1750 RPM, 220/440 Volt, 3 Phase, 60 Cycle Totally Enclosed Motors.

"New". Has never been used (For immediate sale)

CINDER BLOCK, INC. Ph. Verment 8-3200 9143 Hubbell Ave., Detroit 28, Michigan

# FOR SALE

new #500 Carpenter Septic Tank Form, with manhole cover to meet F.H.A. specifications. Never used. Price \$225.00

O. W. HOUTS & SON, INC. N. Buckhout, State College, Penn.

With FORMULA NO. 640

A clear liquid—7 different resins in a solvent which penetrates if or more into concrete, concrete blocks, stucce; seals, holds (230 psf water pressure, applies quickly — no mixing — no furring — no momentance—ne cleanup. Use on forme—wood or sonewab.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

# FOR SALE

2 yd. Hercules Aircreter body mounted on 1949 Ford, F-6, 8 cylinder truck. Truck and body in excellent condition, tires good, mileage 25,000. Selling because of standardisation on larger units.

ASBURY PARK SALES & SERVICE, INC. (Ph. A.P. 2-0585) Main Street at Sewell Ave., Asbury Park, N.J.

FOR SALE

i-Dunn Brick Machine and pallets.

1-F. C. George Block Machine—2 blocks

4" and 8" attachments and pallets.

Both units in good working condition. Replacing with larger equipment.

BUILDERS SUPPLY COMPANY 500 So. Virginia

# BLOCK PLANT FOR SALE GULFPORT, MISS.

Going Corporation. Year 'round operation. No weather delays. Limited block production. New equipment installed for sax concrete. Delivery trucks. Office, warehouse and plant buildings located on own property in center of City on trackage. Additional ground available adjoining plant for major block production to handle Government and Industrial projects to be bid. Priced to sell at \$49,000,00 Write or wire: Box K-83 CONCRETE PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Ill.

# FOR SALE

1 sack portable cement mixer. \$300.00 AKIN LUMBER CO. Westville, Okla.

CONCRETE BRICK COLORS CEMENT COLORS MORTAR COLORS

made by BLUE RIDGE TALC CO., INC. Henry, Virginio

## CEMENT COLORS

Write for free samples and prices of "LANSCO" CEMENT COLORS produced in 50 attractive shades. Packed in bulk and in 1 lb. and 5 lb. packages, manufactured by

LANDERS-SEGAL COLOR CO. Hevan St. Brooklyn 31, N. Y. 73 Delevan St.

# FOR SALE

For sale: Tyra vibrating machine, with 1000 steel pallets making 8x8x16, PL blocks, 8x8x8 Pl, blocks and corner blocks. In very good condition. Price \$650,00. WANT TO BUY 5 steel racks with 48 block capacity, Lakeside Gravel & Block Co. Wangare, Wis. block capacity. La Co., Waupaca, Wis.

# FOR SALE

1-TD-40 International Bulldozer 10 foot Angle Blade. In good operating condition. Blade 3 years old. Price \$1500.00. Bonded Cinder Crusher. Good Condition. Price \$300.00.

ATHENS BUILDING MATERIAL CO.

# FOR SALE

One Spider for 71/2 Austin Crusher, new condition. One new Bushing in factory crate.

MIDLAND SLAG COMPANY P. O. Box 125 Midland, Pa. Phone: 33634

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH **ROCK PRODUCTS** 

100,000 PALLETS IN STOCK

CONCRETE BLOCK MACHINES

1—29 Jolicrete complete with Base, Motors
4-8-12 Mold Baxes, ess base ... \$2000.00

1—27 Jolicrete complete with Motors
4-8-12 Mold Baxes, less base ... \$2000.00

1—5TEARNS CLIPPER STRIPPER ... \$750.00

Townworter Fork Lift, 4000 lbs. caps... LIFT TRUCKS
Clark Fork Lift, Solid Rubber Tires,
3500 lbs. capacity
Ross Fork Lift, Solid Rubber Tires,
7500 lbs. capacity
Towmotor Fork Lift, 4000 lbs. cap.,
cubing forks, pneumatic tires. 1-STEARNS CLIPPER STRIPPER ..... \$750.00 \$2500.00 SKIP LOADERS 1-NEW HOLLARD CINDER CRUSHER, 1—Stearns, 18 cu. ft. 1—Stearns, 42 cu. ft. 5600.00 LARGEST STOCK OF STEEL, ALUMINUM, AND CAST IRON PALLETS IN THE WORLD. SEND TRACING OR SAMPLE FOR QUOTATION. 

# GENERAL ENGINES CO., INC.

307 Hunter Street Gloucester, N. J.
Cable Address: GENERENG Phones: Glou 6-1337 & 1338

WE BUY COMPLETE PLANTS

\$1500.00

# FOR SALE HIGHLY DIVERSIFIED MODERN BLOCK PLANT

Ideally situated plant in lower Connecticut with adequate acreage, adjacent railroad. Two block per cycle, fully automatic, plain pallet machine, 30 cu. ft. mixer, conveyor, racks, etc. Capacity 5,000 blocks daily. Plant includes 30 H.P. steam generator, various lift trucks, 400 Amp electric service for expansion, miscellaneous small tools, and completely furnished and equipped office. Will consider separate sale of equipment though highly attractive tax-wise if entire plant is considered. Prefer to deal with principals only. Box K-77 CONCRETE PRODUCTS, 309 W. Jackson Blyd., Chicago 6, Ill.

### WANTED

Want a Jackson-Church brick machine. Send full details and lowest price. Mail only.

W. F. COLE

3557 Shelmire.

Philadelphia, Pa.

# FOR SALE

1 Besser 3 Block Machine Completely Rebuilt First Class Condition Throughout

TRUAX MACHINE & TOOL COMPANY Phone LAnder 0740
16 Michigan St., Seattle 8, Washington

# TRUCK MIXERS FOR SALE

One Ransome and one Smith, both 3 yd., high dump, end loaders; mounted on D8 International trucks. Priced very reasonable.

MARION S. BRANCH COMPANY P.O. Box 596 Lynchburg, Va

# **BLOCK PLANT WANTED**

Up-to-date plant. Established at least 2 years. Location must be in Missouri, Kansas, Oklahoma, Arkansas, Texas or Louisiana. Write full details as to equipment, buildings, gross business 1850 and 1851. Box K82, CONCRETE PRODUCTS, 309 W. Jackson Bivd., Chicago 6,

FOR SALE

I—Dunbrick Machine with motor and transmission complete CDB-47

I—#616 Mixer with motor and transmission

complete.
39 Dunbrick steel carts, capacity 720 brick

9000 steel pailets (3 brick type) 2 Rubber tired jacks.

PAUL DOGGETT DUNBRICK COMPANY Box 311, FOrest City, North Carolina.

# **ENGINEER EXECUTIVE**

with 27 years experience in all phases of the concrete industry. Associate Member of ASCE, member of ACI. and liceused professional engineer. Prominent in local business and professional organizations and at present General Manager of large concrete products plant in Middle West. Health xcellent. Prefer far west or south west. Box K-81, CONCRETE PRODUCTS, 309 W. Jackson Blvd. CHICAGO 6. Ill.

## FOR SALE

BLOCK PLANT—Capacity 1800 blocks daily. In city of 18,000—no other within 40 miles. Photos and complete information furnished on request. Price \$30,000.00. Might consider \$10,000 cash for partial interest, with privilege of acquiring busi-

CAMERON, JOYCE & SCHNEIDER, INC. lowe



## FOR SALE

Hesser V-3 Super-Vibrapac, all attach-ments: 4800-18½x26 pallets. Fifteen blocks per minute. Available after first of Sept.

ANGELO LANE CONCRETE BLOCK PLANT R.D. No. 5, Box 224, Pgh. 5, Pa. Phone Carnegie 3039

# "GOOD WILL BUILDERS"

That fit in the concrete block business. U.B. Linestretchers — Line Pins — Corner Line Blocks — Twigs & Jointing tools for the blocklayer by

UNITED BUILDERS 1822 Lindberg Drive Muskegon, Mich.

# FOR SALE

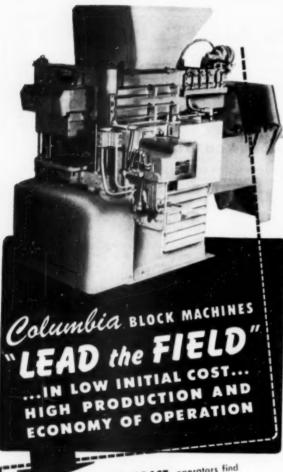
4-2 cubic yard, high discharge Jaeger Mixers, Model 2HC, powered by Hercules gas engine.

TRIANGLE CONSTRUCTION CO. 480 North Evergeen Ave. Kankakee, III.

# PACKER-HEAD WINGS

Both McCracken Type and Martin Trowclers—PROVED to last as lang or langer — yet cost considerably less. Write for prices.

TEXAS FOUNDRIES



the Columbia line a leader in its field! Its compact, rugged construction assures longer performance under most severe operating conditions ...moving, rotary parts are made with needle bearings, hardened pins and enclosed within the machine for protection from grit.

COLUMBIA'S 100% oil hydraulic, fingertip controls and automatic pallet feeder offer higher production capacities and utmost economy. Its production capacities and utmost economy. Its plexible operation—from fully automatic to manual in a flip of a switch—is an advantage when changing molds or starting or ending a shift.

THE COLUMBIA IS SIMPLE IN DESIGN and produces precision, modular blocks from over 200 different types of molds and uses either light or heavy weight aggregate. Parts are standard. Steel or wood pallets may be used. Dollar for dollar—the finest machine on the market today! Write for complete details.

SALES AND SERVICE THROUGHOUT U. S. AND CANADA

here is a Representative in Your Area

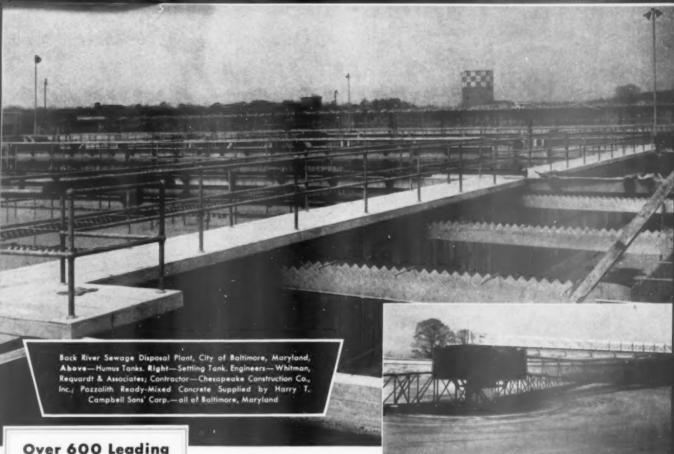
Columbia MACHINE

107 S. GRAND AVE. VANCOUVER, WASH.

# INDEX TO ADVERTISERS IN THE CONCRETE PRODUCTS SECTION OF ROCK PRODUCTS

SEE INDEX OF ROCK PRODUCTS SECTION ADVERTISERS ON PAGES 165, 166

Akin Lumber Company14
Anglo-Scottish Tool Company, Ltd
Ashury Park Sales & Service, Inc
Athens Building Material Company14
Besser Manufacturing Company
Blaw-Knox Company
Blue Ridge Talc Company, Inc
Bonded Scale & Machine Company
Branch, Marion S., Co14
Builders Supply Co
Cameron, Joyce, & Schneider, Inc
Chain Belt Company
Cinder Block, Inc146
Cole, W. F
Columbia Machine Works
Commercial Shearing & Stamping Co
Concrete Pipe Machinery Company
Concrete Transport Mixer Company
Cook Brothers Equipment Company
Doggett, Paul, Dunbrick Company
Farquahar, A. B., Company
General Engines Company, Inc
Haynes Products Company146
Houts, O. W., & Son, Inc
Jaeger Machine Company
Johnson, C. S., Company
Kelly Corporation
Kent Machine Company
Koehring Company
Lakeside Gravel & Block Company
Landers-Segal Color Company
Lane, Angelo, Concrete Block Plant
Lippert, L. K., Company
Martin Engineering Company144
Master Builders Company
Midland Slag Co
Multiplex Machinery Corporation
New Haven Vibrator Company
Oswalt Engineering Service Corp
Roebling's, John A., Son Co
Smith, T. L., Co
Spo Incorporated
Star Expansion Products Company
Texas Foundries
Towmotor Corporation
Triangle Construction Company
Truax Machine & Tool Company
Unit Crane & Shovel Corp
United Builders147
United States Steel Corp
Universal Atlas Cement Co
Willard Concrete Machinery Co
Williams, C. K., & Company



# Over 600 Leading Ready-Mixed Plants

are now equipped with the

# POZZOLITH AUTOMATIC DISPENSER

WHY?

Because a producer can, at lower cost:

- Produce concrete of low permeability . . . with normal Portland cement.
- 2. Produce high-early strength concrete . . . with normal Portland cement.
- Produce air entrained concrete without strength loss
   . . with normal Portland cement.
- 4. Produce all of the above properties out of one cement bin . . . with normal Portland cement stepping up production, reducing inconvenience in handling and cutting costs.

In normal mixes, concrete of any given durability, strength and work-ability, is produced more economically with Pozzolith than by any other means.

# Superior Concrete Today and Tomorrow... with POZZOLITH

Improved concrete properties obtained with Pozzolith resulted in important advantages during the construction of this \$2,000,000 sewage works project... will provide equally important advantages throughout the life of the plant.

Ideal workability with reduced water and good cohesiveness provided easy placeability for thin wall sections, low shrinkage and no segregation.

Other immediate benefits obtained with Pozzolith were designed strength, high bond of concrete to steel and low permeability.

Pozzolith Concrete's resistance to corrosion and exceptional resistance to freezing and thawing will provide the long term benefits of added years of service and low maintenance expense.

Pozzolith provides these benefits — at lower cost than by any other means — because it disperses cement, reduces water and entrains the optimum amount of air.

Full information on request.

Over 600 Leading Ready-Mix Plants
Are Producing Pozzolith Ready-Mixed Concrete



CLEVELAND 3, OHIO

Subsidiary of American-Marietta Company

TORONTO, ONTARIO

# Smile that Convinces Nr. Charles E. Abriles General Manager of Abriles Brick Co.

This Successful Products Manufacturer Discovered the Profit Possibilities of Besser Vibrapac Equipment

Mr. Alwine has good reasons to smile. Not only has his firm, the Alwine Brick Company, recently celebrated its 100th Anniversary, but it discovered another excellent source of profit . . . the manufacture and sale of Vibrapac Block.

Long a successful leader in the brick industry, the Alwine Brick Company saw the advantage of installing Besser Vibrapac equipment. With the dependable Super Vibrapac, the company supplies ALL the masonry units required for a building structure. All sizes of block, brick or tile are made on one set of Plain Pallets, with any desired texture, finish or color. The versatile, automatic Super Vibrapac sets the pace for high production of quality block and assures maximum plant profits.

Why not investigate the profit possibilities of the Vibrapac machine. Besser engineers will gladly assist you. Write for literature.

BESSER MANUFACTURING CO.

Complete Equipment for Concrete Products Plants

ALPENA, MICHIGAN, U.S.A.



FREE BULLETIN

Ask for your copy of the Besser Bulletin, entitled "Modern Building Material." It illustrates the many standard masonry units that can be produced on a Besser Super Vibrapac machine, using Plain Pallets.

# BESSER VIBRAPAC

— the World's Leading Concrete Block Machine. One man removes finished block with power off-bearing hoist and, with no lost motion, returns empty pallets to the Vibrapac machine, Produces three 7 % " x 7%" x 15 % " units at a time on one Plain Pallet. Smaller units made in larger multiples on the same pallets. Continuous, full capacity operation . . . fully automatic, including front feeding of pallets. Hand labor reduced to pushing a switch button and guiding a power off-bearing hoist.

SKIP

BATCH

MIXERS

BLOCK & BRICK CUBERS SUPER

目記

SINTERING PLANTS ACROW

ROOF TILE MACHINE

# It takes a MANITOWOC for Jobs like this.

Wherever there's rock, you'll find a Manitowoc . . . like this Model 3500 at the St. Louis Quarry of the Missouri Portland Cement Company.

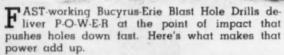
Equipped with a 2 yd. dipper, 27' sticks, on a 35' boom, this husky, powerful Manitowoc is "eating up" tough shale at a real profit producing clip. The 35' boom provides extra reach, enabling the machine to stay far enough away from the bank to be safe from slides, and also loosen overhanging rock without danger.

The Torque Converter too makes a big difference. You get smoother power, elimination of shock loads, maximum engine efficiency, an infinite number of speeds automatically without shifting. It all adds up to more production at lower net cost. Send for complete details. Manitowoc Engineering Works, Manitowoc, Wisconsin.

MANITOWOGIES
SHOVELS JULIUS YOU CRANES 18-100 TON

# How Bucyrus-Erie Drills Give You

DRILLING FOOTAGE ...EVERY SHIFT



Rapid, Even Drilling Rhythm Bucyrus-Erie drills travel at the rate of between 55 and 58 evenly spaced strokes per minute. This fast, even stroke coupled with the sharp hit-and-snap-up action provided by the derrick head shock absorbers shatters rock in a hurry.

Long Stroke Bucyrus-Erie drills match smooth drilling motion with a long stroke. (46-in. maximum for 42-T, 44-in. for 29-T, 40-in. for 27-T, 36-in. for 22-T.) It's this long stroke that multiplies the impact of the tool string.

Tool Strings of Maximum Weight Bucyrus-Erie drills can handle extra tool strings because these rigs combine strong, rigid steel construction with plentiful reserve power. Add heavy tool strings to fast, sharp action and a long stroke and you have the answer to Bucyrus-Erie's leadership in high-speed, low-cost hole footage.

There are many additional reasons why Bucyrus-Erie's are the Big Four of blast hole drilling. Write for full details.

22-T 5%" to 6%" holes

27-T 6" to 6 %" holes

29-T 6" to 9" holes

42-T 9" to 12" holes

Diesel or electric power is available for all machines, gasoline for all except 42-T.

BUCYRUS

SOUTH MILWAUKEE, WISCONSIN

# This Department Is Never Busy

... but SECO VIBRATING SCREENS ARE!



# Long Life PERFORMANCE Means PROFITABLE SCREENING for SECO Users

If you have Seco vibrating screens on your job . . . it's good to know that you can get **quick service** on any parts replacements you may ever require. That's part of Seco's service policy . . . another of the reasons why you put your confidence in the Seco organization.

# ... BUT HERE'S SOMETHING MORE IMPORTANT!

Seco vibrating screens are **built to endure**. The smooth, balanced performance of patented Seco vibrating screens pays off in long life . . . and a holiday from excessive maintenance worries. **It's a proven fact!** Thousands of busy Seco vibrating screens can't keep our parts department busy.



WHAT'S AHEAD?

Check your screening requirements now PLAY SAFE! REPLACE OR ENLARGE WITH

PERFORMANCE PROVEN

SECO VIBRATING SCREENS

MADE ONLY BY

SCREEN EQUIPMENT COMPANY, INC.

1750 WALDEN AVE.

BUFFALO 25, N. Y.

IN CANADA: UNITED STEEL CORP.

TORONTO, ONTARIO

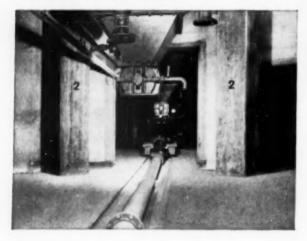


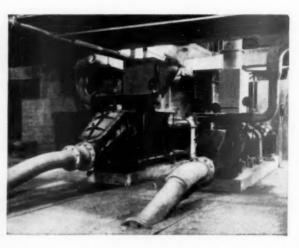




THREE AND ONE HALF DECK Fuller-Kinyon 9-inch Type H Pump (left) conveys 80 tons of dry, raw materials an hour, a distance of 592 feet; the 8-inch Type H Pump conveys dry, pulverized material a distance of 502 feet from mills to silos.

Fuller-Kinyon 7-inch Type H Portable Pump conveys 400 bbl. of finished cement a distance of 398 feet from silos to packer bins.





# DRY, FINE MATERIALS PUMPED LIKE A FLUID

with the

# Typical Materials Conveyed By Fuller-Kinyon Systems

Asphalt filler dust

Barvtes

Bauxite

Catalysts

Cement (Portland)

Cement raw Materials

Chalk

Clays (dried)

Coal (pulverized)

Coke dust

Dolomite (pulverized) Feldspar

Pt ... 4...

Flue dust

Fly ash

Fuller's earth

Gypsum (calcined)
Gypsum (raw)

Lime

Limestone (pulverized)

Magnesite

Manganese dioxide

Ores (pulverized)

Phosphate rock (pulverized)

Rock dust

Soda ash

Starch

# FULLER-KINYON

Large quantities of dry, pulverized materials—aerated to the point of fluidity—can be pumped quickly to storage bins and silos, packer bins, bulk-loading stations and between processing points, just like any fluid.

The Fuller-Kinyon Conveying System has the advantage of stable operation under varying loads, and offers a wide range of capacities to choose from. The System's network of air-tight ducts allows materials to flow horizontally, vertically, and around corners . . . an economical arrangement for process plants with limited space in which to install pulverized material-conveying equipment.

If your present bulk handling system does not have these advantages—ask a Fuller engineer to survey your set-up. There's no obligation on your part, with a wealth of new facts to be gained on economical conveying.

# Fuller

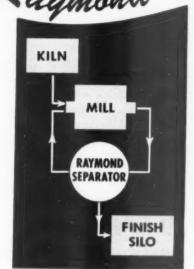
FULLER COMPANY
Catasauqua, Pa.
120 So. LaSalle St., Chicago 3
420 Chancery Bldg., San Francisco 4

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS-COMPRESSORS AND VACUUM PUMPS-FEEDERS AND ASSOCIATED EQUIPMENT

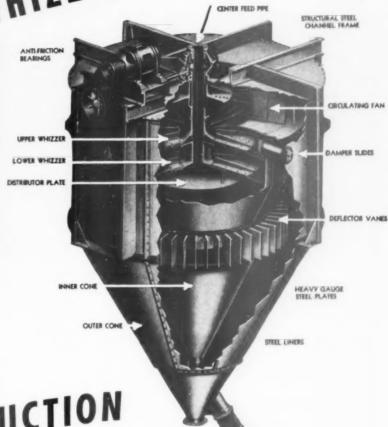
P-135

Raymond WHIZZER SEPARATION

STRUCTURAL STREET
CHANNEL FRAME



The Raymond Mechanical Air Separator is an important "link" in your coment production line



improves PRODUCTION

Ask for this new Bulletin No. 71, which describes many other uses of Raymond Air Separa-

THE Whizzer principle of classification in Raymond Mechanical Air Separators is an important advantage in closed circuit grinding operations, especially in handling raw mix and cement clinker.

PRODUCT

TAHINGS

The Double Whizzer Separator in combination with slide damper control gives wide range fineness adjustment . . . from standard Portland to high early strength specifications. Superior results are assured by:-

> Closer separation of the fines Cleaner tailings discharge Easy control of "surface area" Greater capacity and uniformity Overall economy in operation

Specify the Raymond Double Whizzer Separator for improving your cement production and reducing the per-barrel-cost through greatly increased mill output.

COMBUSTION ENGINEERING - SUPERHEATER, INC.

1307 North Branch Street Chicago 22, Illinois

aumono VERIZER DIVISION

Sales Offices in **Principal Cities** 

# The holes cannot stretch-



# in Hendrick Perforated Metal Screens

On vibrating and shaking screens Hendrick Perforated Metal Plate maintains its uniformity of mesh throughout an unrivaled length of service life.

When it is to be used for screening especially abrasive material, the plate is heat-treated to increase its toughness.

The full clearance of Hendrick Perforated Plate practically obviates elogging. Another time-saving and cost-reducing feature is the ease and rapidity with which decks can be changed.

Write for a copy of the Hendrick Perforated Plate Catalogue, which lists fifteen hundred regular combinations of shapes and sizes of perforations in which Hendrick Perforated Plate can be furnished.

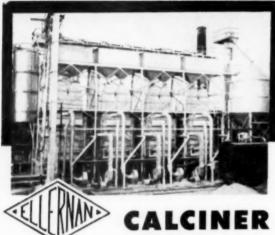


# HENDRICK

Perforated Metals Perforated Metal Screens Wedge-Slot Screens **Architectural Grilles** Mitco Open Steel Flooring, Shur-Site Treads, Armorgrids

Manufacturing Company 47 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities



For Burning LIMESTONE, DOLOMITE, etc.

2 SIZES AVAILABLE

PREHEATS - CALCINES - COOLS AUTOMATIC CONTINUOUS OPERATION MINIMUM FUEL CONSUMPTION

There are extra dividends available in the operation of your plant when you use Ellernan Calciners . . . let us explain the exclusive features . . . write today for literature and detailed information applicable to your operation.

THE ELLERNAN CO.

Continental Bank Bldg.

# STEEL SCRAP ... OF ALL KINDS!

Steel mills and foundries need more scrap.

more scrap.

Not just "production" scrap from metal-fabricating plants . . . but also all sorts of idle iron and steel—from all types of plants.

Search your plant for this idle metal . . . work with your local scrap dealer to increase supplies of badly-needed iron and steel scrap.

# What to look for . . .

obsolete machines, tools and equipment, no-longer-used jigs and fixtures, worn-out or broken chains, wheels, pulleys, gears, pipe, tanks, drums and abandoned metal structures. Non-ferrous is needed,



# Gyrasphere Liners' Life Doubled with

# RESISTO – LOY

The upper half of large pattern mantle liners receives an exceptionally severe abrasion. A single application of RESISTO-LOY will give the liner about DOUBLE the period of wear. In most cases the lower section which does most of the crushing is replaced about twice as often as the upper half. This replacement permits the re-application of RESISTO-LOY to the upper half, and if this maintenance is carried on each time the liners are changed, the upper half can be made to last indefinitely.



The first application is another job we do NOT recommend for the plant maintenance welder, as special equipment is required to handle the liner in the application of the RESISTO-LOY. However, it is possible for the plant welder to carry on the regular RE-APPLICATION of RESISTO-LOY, if it has not been worn too deeply into the manganese. This is one of the outstanding economy jobs our field man would like to show you.

RESISTO-LOY CO., MANUFACTURERS, GRAND RAPIDS 7, MICHIGAN

# UNLOAD...

# THE WHOLE LOAD

Quickly - Safely!

Are you giving "free rides" to "load-hangers"? The LANDIS revolutionary, new, smooth-surface trailer bed eliminates load-hanging. Dump the whole load! This means less cost; faster, smoother operation.



Now, the LANDIS trailer's twin hydraulic lifts dump the entire load in one smooth operation.

You can get end, side or bottom dump and safe, sure positive connection with instant response. Remember: a LANDIS FLEET is an economical, effective, dependable fleet!



The LANDIS 11.1 yard off-highway end-dump trailer ready to unload.

# Air, Mechanical or Hydraulic Controls

Write today for information on how LANDIS can help you hauf for less!

# LANDIS STEEL CO.

Box 248 PICHER, OKLA.

Phone 734

# NEED SPROCKETS?

Sprockets for Mill and Roller Chain



YUBA-Schrock sprockets are flame cut from steel plate. Patented cam-generated action produces sprocket teeth guaranteed to fit standard mill or roller chain with wearing qualities equal to sprockets made by other manufacturing methods. "Special" sprockets with "non-standard" number of teeth readily cut to order without penalty charges. Most emergency orders filled in 24 hours.



Phone, write or wire, nearest office NOW for quotations and deliveries.

# YUBA MANUFACTURING CO.

Reom 717 , 351 California Street • San Francisco EXbrook 2-0274

Benicia, Calif. Phone 628

Stockton Iron Works - Stockton 7-7091















SINCE 1872 the J. B. Ehrsam and Sons Mfg. Co. has been making power transmission equipment for grain elevatars, mills and the nonmetallic minerals industry.

Among items manufactured are pulleys, gears, plain and anti-friction bearings, shofting, collars, clutches, sprockets, chain, pillow blacks, V-belt sheaves, flexible and rigid couplings, take-ups, worm gear reducers, belt and screw conveyors and accessories.

Call in an Ehrsam sales engineer when you have machinery problems.

ADDRESS INQUIRIES TO DEPT. "R"

MANUFACTURING COMPANY ENTERPRISE KANSAS U.S.A.

# HINGED PLATEGRIP

For Heavy Conveyor Belts of changing length

These heavy-duty belt fasteners make a strong, flexible joint in conveyor belts, belts of any width and of from 35" to 52" thickness. They offer special advantages in mines, quarries or industrial set-ups where length or position of belt is frequently changed, because sections can be removed or added at will. Joints are opened for this purpose by simply pulling out the hinge pin.

Easily and quickly applied on the job or in the shop. Special design gives deep compression into belting and smooth, flush joint.





QUINN WIRE & IRON WORKS 1603 12"ST. BOONE, IOWA



# 300ming to New Highs



Illustrating "CROSS"
Perforated Steel Corrugated Deck for
VIRRATING SCREENS

"CROSS" PERFORATED
STEEL PLATES and SECTIONS
for \*VIBRATING \*SHAKING
and \*REVOLVING SCREENS

Look for this Stamp on all "Cross" Products



the Sign of PLUS QUALITY for PLUS PERFORMANCE

VITAL FOR AMERICAN INDUSTRY

DESCRIPTIVE LITERATURE ON REQUEST

# CROSS ENGINEERING COMPANY

**Manufacturing Plant and Offices** 

Carbondale—Telephone: 300—Pennsylvania
"CROSS" Service Agencies in all Principal Cities, and
Efficient Manufacturing Facilities are AT YOUR SERVICE.

New York, 101 Park Ave.-MUrray Hill 5-0253



FASTENERS and RIP PLATES



FOR HEAVY
CONVEYOR
AND
ELEVATOR
BELTS OF
ANY WIDTH

- ★ FLEXCO Fasteners make tight butt joints of great strength and durability.
- ★ Trough naturally, operate smoothly through take-up pulleys.
- ★ Distribute pull or tension uniformly.
- ★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.



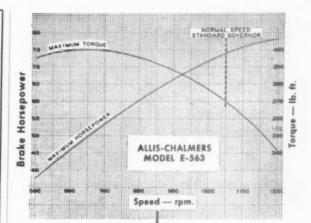
Compression Grip distributes strain over whole plate area

★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.

Order From Your Supply House. Ask for Bulletin F-100

FLEXIBLE STEEL LACING CO.

4684 Lexington St., Chicago 44, III.



# GRAPHIC PROOF

that A-C Power Units are Tailor-made for Crushing, Hoisting, other Sudden Overload Jobs

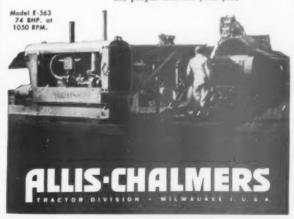
HIGH TORQUE CHARACTERISTICS — Above curve shows how A-C engines build up necessary torque quickly even when throttled way down...handle the sudden overloads so common to crushing and allied service.

SUPER-SENSITIVE GOVERNOR — helps lick overloads before they get started One crusher operator's comment: "That A-C engine seems to 'see' big rocks topple in . . it's all ready when they hit the jaws."

**REAL DUST PROTECTION** — Oil bath type air cleaners are standard on Allis-Chalmers power units, as well as fuel and lube oil filters. In addition, oil seals protect crankshaft; water pump is self-sealing.

MEDIUM SPEED, HEAVY-DUTY DESIGN — assures steady flow of power, extra long life at lowest cost. You also save on first cost because these engines are mass-produced along with tractor engines by the thousands.

A-C power units operate economically on gasoline, natural gas or low grade fuel, and there are accessories to fit a wide variety of applications. Our power engineers will gladly help you select the proper unit for your job.



# CLASSIFIED ADVERTISEMENTS

# STOCK SPECIALS FOR SALE OR RENT

- 1—Bay City Model 65, 1¼ yd. Crawler Shovel-Hoe Diesel. Late model, excellent condition.
- Osgood 1 yd. Crawler Crane, 50' boom, gas power. Good condition.
- 1—Bay City Model 42, ¾ yd. crawler Shovel-Hoe-Crane. Perfect running order.
- 1—Marion Model 331, heavy duty ¾ yd. Shovel. Gas power. Re-built.
- 1—Buckeye Model 70, % yd. Crawler Hoe, Shovel, Diesel Power. Late model.
- 1—Lorain Model 40, ¾ yd. Crawl-er Crane Shovel & Hoe. Gasoline power. Rebuilt.
- 1—Byers, Model 83, ¾ yd. Crawler Hoe or Crane, gasoline power. Rebuilt.
- 1-Bay City Model 25, ½ yd. crawler hoe crane, gas powered. Excellent condition.
- 1—General, heavy duty, ½ yd. crawler shovel, hoe or crane. Gasoline power. Rebuilt.
- 1—Insley Model K12, ½ yd. 1947, & hoe on 18" crawlers, Powered by gas engine. Excellent condi-
- 1—Bay City Tractor Shovel, Hoe or Crane, "Pups" % yd., % swing Crawler mounted, Gas driven
- Bay City Model 15, truck crane 35 ft. boom, hoe and shovel, mounted on A.C. Mack chassis.
- Bay City Model 15-T-40 Cranemobile, ½ yd., 10 ton capacity, gas power, late model. Excellent condition.
- 1—Lorain Model 40 crane, 10 wheel chassis, 60' boom. Good all chassis, 60' around.
- -Universal truck crane, 28 ft. boom, mounted on A.C. Mack chassis. Cheap.
- Clamshell buckets, % to 2 cu. yd. also several crane booms, trench hoes and shovel attachmentsassorted makes.
- 1-PH 255A Hoe attachment, 38" bucket.
- 1-PH 855LC Shovel Front, 2 cu. yd. bucket less than 2 months

Check on what you may require

# Eugene P. Reading, Inc.

Walnut St. & B&O R.R. Ph. Chestnut 5-0200 Roselle, New Jersey

# NEW BELT CONVEYOR IDLERS

4000 30 & 36 in. 1000 42 in. Troughing 677 30 & 36 in. 483 42 in. Return 360 60 in. Trough & Return

## NEW CONVEYOR TERMINALS

5 Complete Sets for 30 & 36 in. and 42 in. & 50 in. with gear drives, lagged head pulleys

# NEW VIBRATING SCREENS

NEW DORR CLASSIFIERS

CRUSHERS 42 x 48 AC Superior Jaw 48 in. Telsmith Gyrasphere 51 Symons Short Head Cone 24 x 36 Farrel Jaw

R. C. STANHOPE, 60 E. 42nd St., New York 17, N.Y.

APRON FEEDER: 1-54" x 16 ft. heavy duty.

GYRATORY CRUSHER: Allis-Chaimers 10-K.

CRUSHERS, JAW: Sizes 12" x 15" to 48" x 60"

CRUSHERS, REDUCTION: Symons, Telamith, etc. 2', 3', 4' and 513'.

ROLL CRUSHER: Traylor heavy duty double roll 42" dia., 10" face, amouth sheels with extra new manganese shells.

MINE HOISTS: 150 H.P., 6'8" dia., 6'8" face; 250 H.P., 73" dia., 48" face; 200 H.P., double drums, one clutched, 8' dia., 4' face. All 3 phase, 66 cycle, 2260 volt with control equipment. Head Frame for double shaft 16'9', x 17'2', height 55', with or without 8' dis, sheaves for 1'5' rope. Other Hoists 160 H.P. to 1850 H.P., alngle and double drum with electric equipment.

COMPRESSORS: Worthington DC2, 29/18½ x 21, motor 600 H.P. synckronous, 440 volt, with all auxiliary equipment. 4—Ingersoil Rand Diesel portable, 500 cu. ft. @ 100 lbs. pressure, New 1951.

DIESEL MOTOR: Caterpillar Di3000 portable on skida, 122 H P.

DRYERS or KILNS: 2-16' x 90' heavy duty, with or without auxiliary equipment, condition like NEW. Located Minnesota.

AIR SEPARATOR: 1—Bradley 16 ft. with or without 100 H.P. 440 volt motor, 880 RPM, type Cl. variable speed, 3 phase, 60 cycle; Wound Rotor 300 volts, 222 amps.

PULVERIZERS: Hardings 5' x 22", steel lined, Bail Mill, complete with disc feeder and 30 H.P. motor. Marcy 8' x 12'. Rod Mill, double end, center discharge 500 H.P. motor. 2—5' x 14 ft. Marcy open end Rod Mills.

CLASSIFIERS: 4-Akins and Wemco 54" 78", single serew, double pitch, weir type, 220,440 volt motors, all in new condition. Three of the above located near Reno, Newscondition.

BOOT BUCKET ELEVATORS: 2—Fully en-closed Chain Bucket Elevators 24" x 48" x 48" x 48" x 48" x 7" deep, links 21½ x 4", bucket to bucket center 16", with 10 H.P. motors and speed reducers, 220/440 volt, A.C.

SCREW CONVEYORS: 1-16" x 10 ft. and 1-16" x 12 ft. complete with motors, reducers,

# A. J. O'NEILL

Lansdowne, Pa.

Phila. Phones: MAdison 3-8300-3-8301

IR19. Piones INAS. Universal and IR19. Piones INAS. Williams INSTA and IR180. Holland 24x16 and 18x16. McLanahan 18x24 and 18x30. INAS. Williams Not. 2, 3, 4 and 6, 18x10. INAS. Williams Not. 2, 3, 4 and 6, 18x10. INAS. Williams Not. 2, 3, 4 and 6, 18x10. INAS. Williams INAS.

# SPRING CLEARANCE

# TRANSIT MIXERS

Smith 3 yd. Hi-Discharge Mixer w/1951 Ford Tandem Truck. Rex 3 yd. 1950 Model Hi-Discharge Moto-Mixer w/Ford Tandem Truck & \$5,500.00 Rex "27E" Paver. Bid Drum. Reduced to \$2250.00

### MISCELLANEOUS

MISCELLANEOUS
Diamond 21 yd. New Storage Bin
Schramm "105" Used Portable Compressor.
New Guarantee. Reduced.
Schramm "60" Used Portable Compressor.
New Guarantee. Reduced.
Insley "K-14" Used Sy yd. Dragline.
Universal Port. Pulverizer Plant: No. 5
Pulverizer, Murphy "ME-66" Diesel power plate feeder, 4x8 screen, etc. Pneumatics.

Pulverizing Plant: Universal No. 4 Pulverizer, Murphy diesel power, screen. closed circuit, pneumatics.

Diesel-Electric plant, 50KW.

# EIGHMY EQUIPMENT COMPANY

120 S. Pierpont Rockford, Illinois

# FOR SALE

Hoists, stiffleg and guy derricks, compressors, rail, locomotives, etc.

### Entire Western Quarries Co. Purchased

Bargain Prices on all equipment. Send for detailed listing.

> CENTRAL CONTRACTORS SERVICE, INC. 1150 N. North Branch St. Chicago, Illinois

> > Phone: Michigan 2-1515

## FOR SALE

- 2-EUCLID, Model 9 FDT Tractors with 58 W Bottom Dump Trailers - CUMMINS DIE-SELS, Excellent Condition, and Excellent Rubber.
- 2-LINK-BELT 20' x 6'

REVOLVING SCREENS

WINTER BROTHERS MATERIAL CO., INC. VI 3-4052 Sappington 23, Missouri

IOWA 25°x40° R.B. Jaw Crusher. Only been used 80,000 tons soft limestone. like new, 89500.00. 20°x36° R. B. Universal.
UNIVERSAL Twin Dual Double Rolls, 24°x14° and 24°12′x16°, 82500.00. Pioneer 16°x34°. ROGERS 24°x40° RB Primary Portable, apron feeder, underconveyor 30°x35′, TD-18A, Diesel, Pneumatic tired trailer, Air Brakes, Practically new, \$22,000.00. Also secondary portable hammermill and double roll. A-C "Aero" 33°x6′, New, \$700.00.

NEW HOLLAND 30-36 with top feed chute and discharge chute. Used 820 hours. Like new UNIVERSAL 15"x36" PB, Jaw Crusher, Good

GRUENDLER 12"x30" RB Jaw Crusher. Al, Hammermills & Conveyors

What are you looking for? We may have it WENZEL MACHINERY RENTAL & SALES CO. 2136 Jefferson St., Kansas City, Mo.

I—Kent Maxecon, Type No. 7 Ring Roll
Mill and Drive.

1-No. 4½ Champion Jaw Crusher. 10"x20".

-No. 6 Champ. Jaw Crusher. 12"x26", rebuilt.

-New Holland Swing Hammer Pulverizer.

-New Holland Swing Hammer Pulverizer.

-Id" Jeffrey Apron Conveyor—6" pitch. 27'
centers.

Bucket Elevators. open and totally enclosed,
new and used, as is or rebuilt.

-DUNNSON & HOEHLER, INC.

P. O. Box 162

Lansdowne, Pa.

# JAW CRUSHERS

6" x 3" to 60" x 48"



Before buying or selling any FARREL-BACON JAW CRUSHERS it will pay you to consult

# BACON-PIETSCH CO., Inc.

 ${\rm 149~B'way.} - {\rm N.~Y.~City} - {\rm Di.~9.3620}$ 

Engineers and Manufacturers

Machine Shop Facilities

FEEDERS, Conveyors, Screens, etc.
Send for Catalogue

Euclid Trucks 15 ton-22 ton end dump; 15 Yd. and 25 Yd. bottom dumps; 12 Yd. and 25 Yd. bottom dump without tractors. 4—Elec. Std. Ga. dump car locemories, 600 volt with 17 Std. Ga. air dump cars, 25,000 lb. cap., 130 ct. ft. level, with all electric equipment, Goodman 10 ton mine locemotive, 250 volt. 30° gauge. Ottumwa mine locemotive, 30° volt. 30° yang volt. 30° volt. 30° yang vol

STANLEY B. TROYER
THEATRE BLDG., CROSBY, MINN.
Tel: 500

# RAILS NEW AND TRACK ACCESSORIES

"FASTER FROM FOSTER"
Try us for all of your rail needs. We're buying daily—replenishing our stocks in all sizes. Complete stocks of All Track
Tools & Accessories.



## FOR SALE-NEW

1-3 Deck Rotary Screen serubber-approximately 9'x20'—Acme Iron Works, Manufacturer Top Deck -1'u's Gravel, Middle Deck & & Qutside Deck a-to make sand & pebbles. Will furnish blueprint of screen to interested parties.

PRICE \$4,400.00

F.O.B. Cars—Hoban, Texas
F. M. REEVES & SONS, INC.
Pecos, Texas

# ELECTRICAL MACHINERY

Motors and Generators, Control and Repair Parts. Large Stock. New and Rebuilt. Guaranteed Expert Repair Service. Send us your inquiries.

V. M. NUSSBAUM & CO. Fort Wayne, Indiana

2-Mixer Mobiles with

35' Tower & 10' Ext. 1—Tower Mobile with 40' Tower

> SILVER HILL SAND & GRAVEL CO. 4600 St. Barnabas Rd., S.E. Washington 20, D. C.

# FOR SALE

Lorain Crane 75B Serial R827, 50' boom, Waukesha gas engine. Good operating condition.

STANDARD SAND COMPANY
P.O. Box 290 Grand Haven, Michigan.

# FOR SALE COMPLETE CONVEYOR SYSTEM

250' 36" Complete with Belting, Timken and Ball Bearing Troughing and Return Rolls and Supports.

350' 24" Complete as above.

- 1 SYMONS 4' Cone Crusher.
- 1 No. 5 BATES Gyratory Crusher.
- 1 No. 6 BATES Gyratory Crusher.
- 1 No. 4 TRAYLOR Gyratory Crusher.
- 1 4 Yd. PAGE Dragline Bucket.
- 1 1 Yd. PAGE Dragline Bucket.
- 1 1 Yd. KEISLER Rehandling Clam Bucket.

Electric Motors-5 to 150 HP.

HYMAN-MICHAELS COMPANY 122 So. Michigan Ave., Chicago, III.

### FOR SALE

130 HP Christian 2d & swinger diesel hoist 30 ton Amer. stiffleg derrick. New 50 ton G.E. diesel electric loco. 5 yd. Koppel quarry cars 56½" Ga. 30 ton Brownhoist Locomotive Crane 40 ton Orton Diesel Locomotive Crane 5 ton Steel Stiffleg derrick. New Bucyrus Erie 54B dragline. New 1949 3 yd. Lima 1201 shovel-drag. New 1948

MISSISSIPPI VALLEY EQUIPMENT CO. 513 Locust St. St. Louis 1, Mo.

IMMEDIATE SHIPMENT

# RAILS

NEW RELAYING

SWITCH MATERIAL

ALL TRACK ACCESSORIES

# **MIDWEST STEEL CORPORATION**

CHARLESTON 21, W. VA.

# FOR SALE

- 2—Allis-Chalmers #6-K Gyratory Crushers,
- 1—Allis-Chalmers #9-K Gyratory Crusher.
- 1-Traylor #8 Gyratory Crusher.
- 10-Jackhammers
  - 2-Traylor 8" Gyratory Crushers.

# NEW YORK TRAP ROCK CORPORATION

230 Park Ave. at 47th. St. New York 17, N.Y.

# FOR SALE SAND and GRAVEL BUSINESS

Includes a crushing plant and 1500 lb. hot plant.

R. J. Miles, P.O. Box 458, Colfax, Calif.



PIPE — Small and Large Diameter, from our Stock

> Welded Seamless Corrugated

Supplies of Fittings Valves and Tube Turns Power Piping Fabrication SPEED-LAY Pipe System Quick Assembly Economical, Light Weight Write for Brochure

# ALBERT

PIPE SUPPLY CO., INC.

Berry at North 13th Sts., Brooklyn 11, N. Y.
Phone EVergreen 7-8100

# NEW RAILS RELAYERS IN STOCK - PROMPT SHIPMENT

All sections, new and relaying Rails, Angle Bars, Frogs, Switches, Spikes, Bolts and all accessories; cars and locomotives.

Phone Wire Write

M. K. FRANK 480 Lexington Ave. Park Building New York City Pittsburgh, Penna. 105 Lake St., Reno, Nevada

# AIR HOSE CLEARANCE

200—50' lengths, ¾" x 2 and 3 braid 125# working pressure Universal couplings attached (2 pieces per length) SPECIAL \$15.00 per length

All new well known brands guaranteed.

E. D. HEEHS & SON 1286 Hollywood St., Memphis B, Tenn.

# REBUILT AND NEW

# GUARANTEED MOTORS M.G. SETS • GENERATORS

Hoists • Compressors • Transformers Units of Every Size and Description WE'LL SELL, BUY OR TRADE



1315 W. CERMAK ROAD CHICAGO 8, !LL.



# CORE DRILLING

--anywhere!

We look into the earth"
PENNSYLVANIA
DRILLING COMPANY
Pittsburgh 20, Pa.

# YOU PROFIT WHEN YOU BUY FROM A LONG ESTABLISHED COMPANY

35 Years of Service

### PULVERIZERS:

- 2-#5047 Raymond High Side, 4 rolls, one mill equipped with "whitxer" type air classifier; both mills equipped with Raymond exhausters, cyclones and inter-connecting piping.
- 25057 Raymond 5-roll High Side, each with double cone vacuum air classifier, 211 Raymond exhauster, cyclone collector, inter-connecting piping and 2-50 H.P., 3/60/2200 volt motors, one for the mill and one for the exhauster. 2 #5057
- 6-No. 1, 20, 00, 000 Raymond.
- 3-20, 60, and 8" Raymond Screen Mills.
- 4-Mikro #2SI, 2TH, 4TH,

### BALL AND TUBE MILLS:

- 1-4'6" x 7' Ball Mill, Allis-Chalmers, iron lined, used 100 hours.
- Tube Grinding Mills, made by Traylor E. & M. Co., Allentown, Fa. Silex lined, 4' x 13', 4'6" x 18'6", 4' x 22' and 5 x 20'. Also two 5'6 x 20' iron lined, with motors.
- Pebble Mills, porcelain lined; 3-6'da. x 8', 800 gals, each. 1-6'x 5'; 3-5'x 4', each with ball charge.

### ROTARY KILMS-

- 3 6' x 60' Vulcan Iron Works, complete; each with or without 3' x 50' Rotary Cooler. By installing lifting flights th or without 3' x 50' Rotary By installing lifting flights ins would make excellent heavy kilns
- 7' x 45' Link Belt Kiln, complete; 1— 7' x 120' Vulcan Iron Works; 1—8' x 135' Allis-Chalmers.

- 4 Ruggles-Coles Direct Heat; Class XA2 4' x 20'; Class XF4-54" x 25';
  - 2-Class XF 5' x 40':
  - 4-4' x 30', 5 x 30', 6 x 40', 6 x 60',
  - 1 Louisville 6' x 50' Rotary Steam Tube Dryer; also 6' x 27' Louisville, with 42 S/S tubes.
  - 1-7' x 70' Louisville, Type L, direct

## VIBRATING SCREENS:

- 4 Unused 6' x 14', 2-deck, Allis Chal-mers "Ripl-Flo" type.
- 3 Selectro 3'x 6' 2-deck, 1-3'x 6' 1-deck, all totally enclosed, heavy duty. 1-3' x 6' Colorado Iron Works, 1-deck.
- 1 4' x 8' Tyler Ningara, 3 decks,
- 8-Tyler Hummer, 3' x 5', 4 x 5', 4 x 10'.

# AIR SEPARATORS:

2 Raymond 6' and 16' dis., 1-8' Gayco; 1-16' Sturtevant,

# CRUSHING ROLLS:

- 1-42" x 16' Allis-Chalmers, Type B
- 1-24" x 15" Sturtevant, balanced type
- 1-24" x 32" Penna. Single Roll, with

## DORR CLASSIFIERS:

- 2-7' x 30' Dorr Twin Rake Classifiers
- 2—Two stage Washing Classifiers, each with two rakes in tandem, in atecl trough 26' x 6" long x 3' wide, with
- 1-6' x 14' Hardinge Rotary Counter Cur-rent Classifier, also used for dewaterrent Classifier, also ing and scrubbing.

Also Shovels, Cranes, draglines; Jaw, Gyra tory and other crusners; Jaw, Gyra-tory and other crusners; Symons and Tel-smith Cones; Complete Portable Crushing Plants; Rotary Kitns and Coolers; Air Compressors; Conveyors; etc.

### CONSOLIDATED PRODUCTS COMPANY, INC.

15-16-17 Park Row, New York 38, N.Y. **BArclay 7-0600** 

Penna. SXT-8 hammermill with 125 HP slip ring motor & controller.

Power & Mining 14" x 24" double roll crusher.

Coal crushers, double and single rolls. Double roll cinder crusher, 12" dia, x 16".

Universal laboratory 6" x 4" jaw crusher. Merrick scale for 30" belt conveyor. Magnetic 18" belt feeder, 15' long.

Open 95' elevator, 16" bucket on C111

Enclosed 80', 12" malleable buckets on C102B chain. Open 60' on chain with 14 x 6" x 7%," buckets.

Enclosed 60: 10" buckets on C102B chain. Inclined steel frame, 844 chain cont., bucket elevator.

Cont. 20" buckets on 8-ply belt, 70' center. New 14" and 18" trough belt conveyors. 42" belt conveyor equipment for 200'.

belt conveyor equipment for 400'. 30" belt conveyor equipment for 400'. 20" flat belt conveyor up to 300'.

New & used conveyor belt up to 36". 12", 14", 16" & 21" elevator belt,

L-B apron conveyor, 24" x 46', 1/4" over-lapping plates.

Gear reducers and gear motors Motors, engines, gears, sprockets. Jeffrey-Traylor type 2-A vibrating feeders. Ten single and double deck vibrating

Approx. 50,000' elevator and drive chain. Three electric overhead hoists: 3 ton air

Elevators and conveyors built to order. Sullivan HE-7L single drum 71/2 HP elect.

Stimmel Winches 1½ HP, 110 Volts with Ideal Power Triplex 7' lawn mower. Jaw crushers, pumps, hoists.

> G. A. Unverzagt & Sons 136 Coit St., Irvington, N.J.

# FOR SALE

- 1-5 cu. yd. heavy duty Bucyrus-Erie Shovel dipper, manganese and alloy steel construction with bail and door, Good condition.
- 1-#4033 Cedar Rapids, diesel powered portable hammermill. Excellent condition.
- 1-Dorr Co. 12' dia. x 10' long drum type filter complete. Good condition.
- 1-40 H.P., 865 R.P.M., 440 V, 3 ph. 60 cycles, slip ring motor.

# BASIC REFRACTORIES, INC. Maple Grove, Ohio

PORT, PLANTS: Telsmith w/25x36" crusher Iowa w/15x25 Jaw & 15x24" rolls. CRUSHERS: 19x20 Univ. 19x36 Pioneer, 18x24 & 18x36 Univ. 29x36 Eagle, 48x36 Farrell JAW. No. 25 Kennedy, 13H & 16H Telsmith. 4" Tray-lor, 14" McCully GYB, 5%; CONE 18x24" Mc-Lamahan Sel, Roll. 38x16, 49x22 & 54x24" Mc-Lamahan Sel, Roll. 38x16, 49x22 & 54x24" Mc-

Roll. Rennedy & 636° Colo. Iron Wks. Ball Mills 24° Kennedy & 636° Colo. Iron Wks. Ball Mills 24° Kennedy & 636° 12° Apron Feeders 25° 25° 40° 40° 40° 36° 12° Apron Feeders NW 6425° & 1° 3° 7d. Link Belt K370 DRAG-LINES

INES HOVELS: % yd. Byers, % yd. Koehring, % yd. Link Belt L875, Buckeye 70, NW6, Lorain 77B 797495. Marton 362; NW 78 & solb, Lima 1201 & 5 yd. Clamshell Buckets ou, yd. std. ga. Air Dump Cars

Repres: Bonded Scale & Machine Co. Thurman Machine Co.

MID-CONTINENT EQUIPMENT, INC. 8321 Gannon St. Louis 24, Mo. Wydown 2826

TD-9 Front-End Loader 1950 25 ton Link-Belt HC-90 Truck Crane. MC414 Lorain Truck Crane. 20 ton Bay City Truck Crane. 2 yd. Koehring 803 Crane.

2 yd. Koehring 803 Crane. 355 P&H Dragline. 35 ton Davenport Diesel Elect. Locomo-

35 ton Davenport Diesel Eucus, 2016.

45 ton GE Diesel Electric Loco, 46 ton Orton Diesel Loco, Cranc. 40 ton Orton Diesel Loco, Cranc. 40 ton Industrial Brownhoist Oil Fired Loco Crane—New 1943.

No. 6 and 80-D Northwest Shovels.

10 ton Link-Belt Model 55 Wagon Crane, Pneumatic Tire mounted.

Northwest 25 Shovel Attachment.

45 Crane Boom for Link-Belt LS-90.

8. M. WEISS COMPANY Girard Trust Ce. Bldg., Phile. 2, Pa. Rittenheuse 6-2311

FOR SALE-Allis-Chalmers HD19 & LeTourneau FOR SALE—Allis-Chalmers HD19 & LeTourneau 14 cu. yd. scraper; both pleces of equipment very clean and excellent shape, \$16,600.00, tractor 1949; scraper 1946. Tl. 20 wide gauge Lorain Moto Crane, % yd. clamshell bucket, ½ yd. dragline bucket, 60 ft. boom and many extras. Perfect condition, 1959 machine, \$16,000.00 11-8 Rex cement mixer; used 10 days, just like new, \$2000.00. Peter Bistrian. Amagansett, Long Island, N. Y.

# FOR SALE

Model 6 Northwest 1½ yd. highlift shovel, Murphy Diesel powered, close quarter crowd; very late model, A-1 condition, ready to go. Located our shop.

MERTES MACHINERY CO. 1622 So. First St. Milwaukee 4, Wis.

# FOR SALE

FOR SALE—8 TON 36" GAUGE VULCAN LOCOMOTIVE

LONE STAR CEMENT CORPORATION Birmingham, Ala.

# put 'er here,



500,000 Mail boxes in the United States are your partners in the fight against cancer.

A contribution addressed to "Cancer" in care of your local post office will help guard your family, yourself and your com-

Next time you see a mail box, "put 'er there, partner!" . . . as generously as you can.

# : AMERICAN CANCER SOCIETY

Here is my con in support of t	the Cancer Crusade.
Name	
Address	

# NEW BELT CONVEYOR

IDLERS 30-36-42-60 INCH 3600—30 IN. & 36 IN. WIDE 2728—42 IN. & 60 IN. WIDE

# NEW 30-36-42-60 IN. TERMINALS

30 HEAD AND TAIL SETS

# **NEW VIBRATING SCREENS**

4 ALLIS CHALMERS 6 x 14 - 2 DECK

Clyde Hydrator with Kuntz Continuous Dustless System, 4-5 T.P.H. No. 1 Raymond Auto Pulverizer with throwout, separator & cyclone, Kuntz 5 x 20 continuous hydrator. No. 4 Clyde batch hydrator. 3 roll Bradley Hercules, Jr. pulverizer, Rotary kilns or dryers 4 x 20 & 4 x 45 & 6 x 60 &  $5\frac{1}{2}$  x 7 x 60.

## LOCOMOTIVES

45 ton Plymouth Diesel. 10 ton Davenport Gas.

20 ton Whitcomb Gas.

50 & 80 ton Whitcomb Diesel.

### LOCOMOTIVE CRANES

30 ton Ohio Diesel. 30 ton Industrial gas.

20 ton Orton gasoline.

### CRUSHERS

24 x 36 Farrell Jaw Crusher.

42 x 48 Superior Jaw Crusher.

48 Inch Telsmith Gyrasphere.

51/6 Ft. Symonds Std. Cone.

R. C. STANHOPE, INC. 60 E. 42nd St., N.Y. 17, N.Y.

# FOR SALE

2-Corn vacuvators with motors

1-12" 85' belt conveyors

1-Belt elevator

Electric motors, 3 phase, 60 cycle, 440 volt from 2 HP to 50 HP.

OLLIE E. LAWRENCE

BOX 688

Quincy, Michigan

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH ROCK PRODUCTS

# **EQUIPMENT IN STOCK** IMMEDIATE SHIPMENT

# CRUSHERS

Bartlett & Snow, 14" x 16", 2 roll.
Bartlett & Snow, 24" x 24", single roll.
Raymond #1 with feed conveyor & cyclone.
24" x 18" Jeffrey A2.
40" x 14" two-roll Traylor.
18" 36" Jaw, Traylor, Bulldog.
48" Symons vert. disc.
24" x 24" single roll, Fairfield.

### **DUST COLLECTORS**

4700 CFM, Buell, type AC-130 91/2A1 (6). 10,000 CFM, Birmingham, cyclone. Schmieg Air Washer. 1,006 CFM, Dracco, type AAA, 8'10" x 15'.

# KILNS, COOLERS, DRYERS

1106-35 Roto-Louvre. 10' x 90' x 9/16" Allis Chalmers. 7' x 60' x %" with lifters. 5' x 67' x 5/16" with lifters. 4' x 35' x ½". 4' x 35' x ½". 6' x 14' x 9/16" Struthers-Wells (NEW)

### MILLS

Raymond, 4 roll, 5' x 22', Smidth, Tube. Stedman, four cage. 16" x 40", three roll. Size 1, Allis Chalmers. Williams No. 3. Williams GP-106.

## STORAGE TANKS

135,000 gal. 30' x 26' w/coils. 25,000 gal. 10' x 40' x ¾" (NEW). 12,000 gal. 8' x 32' x ¼" (NEW).

WRITE FOR OUR CATALOGUE

# HEAT & POWER CO., Inc.

70 Pine St. N.Y. 5, Hanover 2-4890

Machinery & Equipment Merchants

# FOR SALE ASH AND COAL HANDLING EQUIPMENT

Complete System

Beaumont Coal-Weighing Larry, with 2-ton Buffalo Scale. 55-Ton Coal Drag-Scraper Winding Machine 35-ton Cap Skip-Hoist Winding Machine 12-Ton Cap Ash Skip-Hoist Winding Machine Track Hopper Ash Gate Hydraulic System Coal and Ash Bunkers Also Motors, Controls & Acces-

# Will sell all or any part. ACORN IRON & SUPPLY CO.

915 No. Delaware Ave. Philadelphia 23, Pa.

# NOTE

ADDRESS ALL

CLASSIFIED ADVERTISING

COPY TO

## ROCK PRODUCTS

309 West Jackson Blvd., Chicago 6, III.

# Special Crushers!!

Telemith 28-B Primary Gyratory Crusher.
Telemith 48" Gyrasphere with 100 HP ele. meter.
Ceder Hapids 4033 Hammermill. Diesel powered.
Raymond No. 412 bowl pulverizer mill
FARREL BACON 36" x 48" Jaw Crusher.

FARKEL BACON 36" x 46" Jaw Crusher.

SHOVELS—CRANES—DRAGLINES

N-W 80-D 2½ yd. Dragline, Diesel, 100" boom.

N-W Model 6, 1½ yd. Diesel Shovel.

Lina Mod. 34. 1 yd. Shovel-Crane-Dragline, Gas

Link Belt K. 375 2 yd. Diesel Bragline

Northwest 80-D Diesel Shovel. 2½ yd. Recond.

Link Belt K580 Shovel. 1948—practically new.

PAR Model 855, 2 yd. Diesel Shovel.

Link 1201, 2½ yd. Diesel Shovel.

Link 1201, 2½ yd. Diesel Shovel.

Lorsin L50 Shovel. 158, yd. complete overhaul.

Link 862, Shovel-Crane-Drag. 2 yd., 8 ft. boom.

Link 862, Shovel-Crane-Drag. 2 yd. Diesel.

Kochring ½ yd. Diesel Shovel.

Line Soil, Shovel-Crane Drag. 2 yd. Diesel.
Koebrling % yd. Diesel Shovel.
Koebrling % yd. Diesel Shovel.
Koebrling % yd. Diesel Shovel.

JAW: Acme 10220, 14226, 14228, 10342, 16322, 18332, 25340. Eagles Joyad. Diamond 24336".

Codar Rapids 10220, 20336, 25340. Farrell 10220, 25340. Farrell 20230, 253400. Farrell 202300, 253400. Farrell 202300, 253400. Farrell 202300, 253400. Farrell 202

mer 66°259′. Freskins 8':70′. 10°290′.
Symons 4' z 10′ 3 deck.
Symons 4' z 10′ 3 deck.
Diester 4' z 10′ 3 deck.
Tyler Hummer 8' z 5′ with motor generator.
Acmo 5' 21′2 Revolv. Revub-Scaip Screen.
Pioner 4' z 10′ Scaipting Screen. New 1946.
Robins 4 x 14 Vibrez Double Deck Screen.
Traylor Apron Feeder 5′ z 48′, heary duty.
Reciprocating Feeder 4′ z 19′, with motor.

Reciprocating Feeder 6 2 19, with motor.

PAYLOADERS AND TRUCKS
Hough HA Payloader 12 ft. buckst. Rabuilt.
Hough HB Payloader with 13 ft. buckst. Excellent.
Hough HB Payloader with 13 ft. buckst. Excellent.
Hough HB 10 wheel Diesel Dump Trucks.
5 Sterling 340 Rear Dump Trucks 22 yd. Diesel.
8 Euclid Model 25 FTD Hottom Dump.
5 Heiliners 16 yds. new tirec condition excellent.

CABLEWAY
Sauerman slack line 1% yd.; electric 90' mast.
Sauerman 3 yd. cableway with 125 HP electric.
Sauerman 1 yd. with Waukesha gas boist.
Sauerman 1 yd. with Waukesha gas boist.

Nauerman 1 yd. with Waugesin gas Bolat.

WELL & WAGON DRILLS

Buc-Eric 27T gas drive well drill. Buc-Eric
42-T Diesel powered well drill.

Loomis 44 Clipper Diesel powered.
3-Model 200 Wagon Drills C-P thock Drills No. 78.

a-model 200 Wagon Drills C-P Hock Drills No. 70.

Hetzel 4 Compart. aggreg. & Cement, 855 bbl.
silo. 2 yd. batcher. Complete. New '51.
Johnson 4 compt. 300 ton agg. I compt. cement, 492 bbl. reserve cement silo.
B-K 110 bbl. cement bin elec. interlocking scales.

NEW F-S 100 ton agg. bin 3 compt. 400 bbl.
cement bin.

ASPMALT DISTRIBUTORS
Hwass 1020 gal. with tractor.
Littleford 1000 gals, on new international truck.

Littleford 1900 gals on new International truck.

ASPHALT PLANTS

Rutler 100 yd. Hits. Concrete plant.

Cedarapids 60°25d' asphalt plant drier. Compl.

Madsen 4000 s complete plant Diesel powered.

Model 8-10 Simplicity. Diesel powered.

8-0 840-830 Maintenance Plant.

McCarter complete plant 3000 s capacity.

Cedar Rapids Model 8A portable plant.

Cummer Semi-Port. 8, ton Pogamil.

Cummer Semi-Port. % ton Fugmili.

GRUSHING PLANTS
Inwa Model 2A Crushing and Screening plant.

Cedar Rapids Model CCC-6024 plant, Dissel pow.

Ploneer 54-VA Port. with 12"224" jaw crusher.

Telsmith Primary Fort. 25"25" jaw crusher Dissel.

Ploneer Scondary Plant. Port. 10" 2.P.B. 1%.

Ploneer Secondary Flant. Fort. 190 T.P.M. 1%.

Amer. Mo. 10-80 Guy Derrick, mast 95', bm 80'
Guy Derrick 15 tons 115' mast. 105' bm.
Morris 19" size. with cutter. Steel hull—48'13'28'.

Ellicott 8" with cutter. Diesel Hull 48'13'28'.

"" Hydraulic. Diesel. On 32'25' steel pontoons.
Amaco 10" Diesel power portable. Excellent.

5" H-P twin Diesel drive. Complets.

DERRICKS
American Terry 20 ton Guy Derrick 100' bm.
American Terry 20 ton stiff leg with holst.
American 25 ton stiff leg derrick 90' boom.
Special 35 ton stiff leg derrick 100' boom.

MAGNETIC PULLEY Dings 20"x38" complete.

RICHARD P. WALSH CO.

New York, N.Y. Cable: RICHWALSH Cortland 7-0723

# FOR SALE Priced To Sell

COMPLETE ELECTRIC LIGHT PLANT

Can be seen at Arkansas Polytechnic College, Russellville, Arkansas. Suitable for small towns, large industrial plants, factories, mills, schools, mines and such like.

DESCRIPTION: ONE SKINNER UNIVERSAL UNIFLOW ENGINE #9718, 225 H.P., 125 STEAM OPERATING PRESSURE • One General Electric Generator (Direct Connected to Skin-ner Universal Uniflow Steam Engine.) Number 34936 IS 9740. Type TRF 32-210-223 Form D. PF 8 Phase 3 AMPS 52-5. KW 168 Speed 223 Volts Full Load 2300. © One General

Electric Exciter. (Belt driven from Shaft of A.C. Volt Generator.) Number 236597 Type ML 15 3505-2. AMPS 72 Speed 1050 Volts 125 KW-9.

Complete Panel Board and Instruments go with this. All in perfect operating condition. FOR FURTHER PARTICULARS CONTACT

AKERS ELECTRIC COMPANY (Ph. 4616) or SMITH BROS. CONSTRUCTION CO. (Ph. 404) HOT SPRINGS

## FOR SALE

Hillis and Jones forged steel rolls (drop ends). Three-eight inches capacity - will roll up to 10-foot widths. Electric controls and drive unit complete with machine.

Write, Wire or Phone (Fairfax 1186) UNIVERSAL CONCRETE PIPE COMPANY

Federal Steel Fabricators Div. 297 S. High Street, Columbus 15, Ohio.

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH ROCK PRODUCTS

# Equipment Values!

PIPE LAYER—"Caterpillar" Diesel De Tractor, ser. #4R1164SP, w/Trackson MD6 Pipe Layer, equipped with front pull hook, crankcase guard, 18" track shoes and Pipe Layer, equipped with front pull hook. crankcase guard, 18" track shoes and counterweights. Checked over, cleaned, paint-ed, rendy for work. FOB Louisville \$7,300.00 TRACTOR—DOZER-Caterpillar Diesel D7, ser, #37524, with LeTourneau Angle blade and LeTourneau DDPCU. This 80 d.b. HP machine has new tracks and rollers, looks and runs right. FOB Paducah, Ky. \$8,385.00 and runs right. FOB Paducah, Ky. \$8,385,00
MOTOR GRADER—Cat Diesel No. 12, ser.
2984616, leaning front wheels, 12 ft.
moldboard and scarrifer, less teeth, mounted on four 13,09224 rear tires, two 7,50824
front tires. Completely gone over, cleaned, painted. FOB Louisville ...\$6,459.00
TRACTOR-DOZER—Cat Diesel DS, ser. 28R898, with LeTourneau angle dozer, LeTourneau DDPCU. Excellent condition, available immediately. FOB Louisville \$8,859.09
SCRAPER—Caterpillar Model 80, ser.
22D2195; 24,09229 oversized rear tires,
21,09224 front tires and pusher block.
Only a few weeks old and a great buy
at this price. FOB Paducah, Ky. \$10,750,00 21.09x24 front tires and pusher block.
Only a few weeks old and a great buy
at this price. FOB Paducab, Ky, \$10,755,00
MOTOR GRADER—Adams Diesel, Mod.
312, ser. #1607, four rear 12.09x24 8-ply
tires, two front 9.09x24 10-ply tires; cab
with doors, scarrifer, electric starter and
lights. Interna. UDS 70 HP Diesel engine. lights. In Excellent appearance and perfo

HAY! 800 W. MAIN ST., LOUISVILLE, KY

## DEPENDABLE USED MACHINES

SPECIAL—Cedar Rapids 10 x 36 roller bearing crusher, latest model,
Link Belt Car Puller
Eagle Cinder Crusher
S x 12 revolving screen
Pioneer 4 x 8 sercen
Pioneer 4 x 8 sercen
Fioneer 4 x 8 sercen
Corain 40 shovel
Rebuilt 20° x 40° port, conveyor
These machines reconditioned in our newly-built daylight plant. Come

10030 Southwest Highway

3 yd. Dumpcrete Hanson truck crane 1½ yd. Page bucket RD7 with bulldozer Falcon 6" pump Oak Lawn, Illinois TRACTOR & EQUIPMENT COMPANY

# FOR SALE

Nearly new, best Cedar Rapids Feeder and 50° x 18" belt conveyor; rollers packed in grease, clutch, motor support, complete grease, clutch, motor support, complete with motor. Will sell for two-thirds of re-

Newaygo Concrete Gravel Co., M.R. #2 Ph. 4662, Newaygo, Michigan.

State.

# FREE SERVICE for Buyers

Here is the quick way to get information and prices on machinery and equipment. Just check the item (or items) listed below about which you desire information. Then send this list to us, and we will take care of the rest.



TEAR OFF HERE



Admixturee. Aggregate Aftercoolers. Air Aggregates (special) Air Compressors Air Separators Asphalt Mixing Plants Bagging Machines Bags Batchers Belting. Conveyor, Elavator, Power Transmission Belting. V-Type Belt Ropair Equipment Bin Level Indicators Bina and Batching Equipment Blasting Supplies Block Machines Conerte Building Bodies, Trailer Brick Machines	Classifiers Clutches Coal Pulverizing Rquipment Concentrating Tables Concrete Mixers Concrete Mixers Planta Concrete Specialty Molds Concrete Waterproofing and Dampproofing and Dampproofing Conveyors Crushers Crushers Cranes Derricks Dewatering Equipment, Sand Diesel Engines Draglines Excavators Draglines	Dust Collecting Equipment & Supplic Electric Motors Engineering Service, Consulting and Designing Explosives & Dynamit Fans & Blowers Flotation Equipment Gasoline Engines Gear Reducers Generator Sets Grinding Media Gypsum Plant Machinery Hard Surfacing Materials Hoists Hoppers Kilns: Rotary, Shaft, Vertical	Mills Pulverizers Pumps Scales Scales Screen Cloth Screens: Crashed Stone, Gravel Shovels, Pewer	Speed Reducers Tanks, Storage Tracks, Industrial Trucks, Miser Body Trucks, Motor Vibrators Welding & Cutting Equipment Winches Wire Rope market for is not listed above, ow.
Molds Bucketa Buildeaure Care, Industrial	Dredge Pumpa Drilling Accessories Drills Dryers	Your A	Name	RP-7
Send to:				
Research :	Service Department	Firm 2	Name	
ROCK	PRODUCTS	Street.		

City\_

Chicago 6, Illinois

309 W. Jackson Blvd.

# - CLASSIFIED ADVERTISEMENTS -

## QUARRY EQUIPMENT

4024 Cedarapids roll, rebuilt 2025 jaw Cedarapids Rock-It plant, 3033 mill, new.

1236 Cedarapids Model 6C plant, new.

4033 Cedarapids hammermill, rebuilt.

1030 Good Roads, reconditioned.

10x7 Allis-Chalmers Blake type jaw crusher. 3' x 6' Kennedy Van Saun triple deck screen.

4' x 6' Kennedy Van Saun single deck screen, 2—15 cu, yd. Cedarapids sand drags, new. 16" x 90' bucket elevator.

60-ton, 2-compartment, 8'x18' storage bin with clamshell gates.

100-ten, 2-compartment, 13'x23' storage bin with clamshell gates.

Special bins to your specifications.

Conveyors—18"—24"—30"—36". Also belt.

# SHOVELS AND CRANES

Lorein L-50, 1-yd. diesel. New condition. Brownhoist 1-yd. gas shovel & crans. Lorain TL-20 diesel powered ½-yd. shovel & hoe.

Link-Belt LS50 gas 1/2-yd. shovel & hoe. P&H 150 gas crane.

### WELL DRILLS AND TOOLS

Sanderson-Cyclone No. 42 well drill, new. Sanderson-Cyclone No. 44 well drill, new. Keystone Model 50. Bits—Stems—Bailers—Sockets, Etc.

### LIFTING MAGNETS

2—45" Ohio lifting magnets, rebuilt. 1—36" ECM lifting magnets, rebuilt.

# GENERATORS AND LIGHT PLANTS

 $1\frac{1}{2}$  KW to 125 KW, alternating and direct current, gasoline and diesel powered.

# AIR COMPRESSORS

500 cu. ft. Gardner-Denver diesel, rebuilt.
105 cu. ft. Schramm gas powered on 4 steel wheels.

105 cu. ft. Ingersoll-Rand on 2 pneumatics, good condition.

Worthington two-stage, water-cooled, vertical 250#, 60 CFM, new condition.

# L. B. SMITH, INC.

Camp Hill, Pa.

Phone

Quarries

**Crushing Plants** 

Storage Methods

**Operating Costs** 

Coment Plants

Harrisburg 7-3431

# NOTE

ADDRESS ALL CLASSIFIED ADVERTISING COPY TO

ROCK PRODUCTS

309 West Jackson Blvd., Chicago 6, III.

# WANTED

Engineer, preferably in early '30's, familiar with Quarry, Crushing, Drying, & Conveying Operations and Equipment, Furnish Resume. (Confidential) Requires Travel, Box K-84, ROCK PRODUCTS, 302 West Jackson Blvd., Chicago 6, III.

# CHIEF CHEMIST Wanted by CEMENT PLANT

Located on Texas Gulf Coast. Must be qualified by training and experience. State age, experience, references and salary expected. Box K-78, ROCK PRODUCTS, 309 West Jackson Blvd., Chicago 6, Ill.

### SPECIALIST

# DIFFICULT PYRO-PROCESSING

Drying—Calcining—Nodulizing Combustion—Fluidization

# MODERN PROCESSING PLANTS

Lime—Gypsum—Expanded Aggregate Refractories—Cement—Rock Wool

WOLF G. BAUER

5213—11th N.E. Seattle, Wash. Cable "Baupro" Phone VE 5874

# WANT TO BUY

35—45 ton 300-350 H.P. Diesel or Diesel Electric Switch Engine.

# TERRE HAUTE GRAVEL COMPANY

P. O. Box 267 Terre Haute, Indiana

# WANTED TO BUY

ONE (1) Eagle Swintex from 50' to 70' long equipped to use with 14'' to 15'' suction pipe.

CONCRETE SUPPLY COMPANY
1212 South 13th Street, Louisville, Ky.

# WANTED

Competent Superintendent for old established colored marble quarry on eastern sesboard. Exceptional opportunity for good man to become manager. Box K-80 ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Illinois.

## POSITION WANTED

Cement Plant Superintendent or Assistant, Graduate Engineer. 15 years experience, cement plant and construction work. Now Plant Superintendent. Desire change.

Box K-7, c/o ROCK PRODUCTS
309 W. Jackson Blvd. Chicago 6. Ill.

## POSITION WANTED

Chemist now employed would like opportunity to operate cement plant. Twenty-eight years experience in the industry. Box K-79 ROCK PRODUCTS, 309 West Jackson Blvd., Chicago 6, Ill.

# E. LEE HEIDENREICH JR.

CONSULTING ENGINEERS

75 Second Street Newburgh Phone

9 South Clinton St. N. Y. Chicago 6 III. 1828 Ph. Franklin 2-4186 Operation Plant Layout Design Appraisals Construction

# INDEX TO CLASSIFIED ADVERTISING

Acorn Iron & Supply Co 163
Akers Electric Co
Albert Pipe Supply Co161
Bacon-Pietsch Co., Inc 161
Basic Refractories, Inc162
Bauer, Wolf, G
Bistrian, Peter162
Central Contractors Service, Inc160
Chicago Electric Company 161
Concrete Supply Company165
Consolidated Products Co., Inc. , ,162
Eighmy Equipment Company160
Foster, L. B
Frank, M. K
Heat & Power Company163
Heehs, E. D. & Son
Heidenreich, E. Lee, Jr165
Hyman-Michaels Company161
Johnson & Hoehler, Inc160
Lawrence, Ollie, E
Lone Star Cement Corporation162
McLeod, Alex T
Mertes Machinery Company162
Mid-Continent Equipment Co 162
Midwest Steel Corporation161
Miles, R. J161
Mississippi Valley Equipment Co. 161
Name Vends Trees Bends Communication
New York Trap Rock Corp 161
Newaygo Concrete Gravel Co164
Nussbaum, V. M., & Co 161
O'Neill, A. J
Pennsylvania Drilling Co 161
Reading, Eugene P., Inc160
Reeves, F. M., & Sons, Inc161
Silver Hill Sand & Gravel Co 161
Smith Brothers Construction164
Smith, L. B., Inc
Standard Sand Company161
Stanhope, R. C
Terre Haute Gravel Company165
Tractor & Equipment Co
Froyer, Stanley, B
Jniversal Concrete Pipe Co164
Inverzagt, G. A., & Sons162
Valsh, R. P. & Co
Veiss, B. M., & Company162
Venzel Machinery Rental
& Sales Co
Vhayne, Roy C., & Co164
Vintar Prothers Metarial Co. L



WIRE ROPE? Again and again Hercules Red-Strand Preformed wire rope outlasts others . . . speeds up operations . . . saves time and money.

Leschen's precise care. close attention to detail, and exacting insistence upon higher-than-rated quality consistently pays off in better service . . . with Hercules Red-Strand Preformed wire rope.

Make your next order Hercules Red-Strand Pre-formed. You'll discover the difference for yourself.



DISTRIBUTORS IN ALL PRINCIPAL CITIES



ST. PAUL 1, MINNESOTA

# INDEX TO DISPLAY ADVERTISERS

INDEX TO	DISPLA
Allis Chalmers Allis Chalmers, Tractor	3, 42, 95
Allis Chalmers, Tractor	
Division	105, 159
Division 1 Allison Division American Brake Shoe Compan	26, 21
American Manganese Steel	y
	92, 93
American Hoist & Derrick	
Company	166
Anglo-Scottish Tool Co., Ltd.	145
Armstrong-Bray & Company	158
Babcock & Wilcox Company	19
Barber-Greene Company	91
Bemis Brothers Bag Company Berg Vault Company	18
Berg Vault Company Besser Mfg. Company	158
Blaw-Knox Company	137
Roston Woven Hose &	
Rubber Company	14
Bucyrus Erie Company	152
California Wire Cloth Corp.	
Caterpillar Tractor Company	5 13
Chain Belt Company 4. 1	128, 129
Chain Belt Company 4, 1 Chicago Pneumatic Tool Comp	pany 22
Chrysler Corporation	99
Colorado Fuel & Iron Corp. Columbia-Geneva Steel Divisio	110
Columbia-Geneva Steel Division	on 107
Columbia Machine Works	148
Combustion Engineering- Superheater, Inc.	155
Commercial Shearing &	100
Stamping Company	144
Concrete Pipe Machinery	
Company Concrete Transport Mixer	142
Concrete Transport Mixer	
Company	145
Cook Brothers Equipment	190
Company Cross Engineering Company	159
Deister Machine Company	. 98
Denver Equipment Company 1 Dodge Trucks	12, 113
DuPont, E. L. de Nemours	16
& Company	30, 31
Eagle Iron Works	36
Ehrsam, J. B., & Sons Ellernan Company	156
Euclid Road Machinery Comp.	any 40
Farquahar, A. B., & Company	138
Farrel-Bacon Flexible Steel Lacing Company Fuller Company	113
Fuller Company	154
General Motors Corp.	
Goodrich, B. F., & Company Goodyear Tire & Rubber	3
Company 9, Back	Cover
Gulf Oil Corporation	97
Hammond Bag & Paper Compa	
Harnischfeger	ny 114
Corp. Inside Back	Cover
Hayward Company	
Hendrick Mfg. Co.	156
Jaeger Machine Company	135
Johnson, C. S., & Company 13	
Joy Manufacturing Company	
Kennedy-Van Saun Mfg. &	1
	10, 11
Kent Machine Company	142
King Powder Company, Inc.	6
Koehring Company 13	2 133

Allis Chalmers 8, 42, 95	Landis Steel Company 15
Allis Chalmers, Tractor	Laughlin, Thomas, Company 10
Division 105, 159	Lee Rubber & Tire Company 1
Allison Division 26, 27	LeRoi Company 2
American Brake Shoe Company	Leschen, A., & Sons
American Manganese Steel	Rope Company 16
Div. 92, 93	LeTourneau, R. G., Inc. 20, 2
American Hoist & Derrick	Link-Belt Company
Company 166	Massahuta Communi
Anglo-Scottish Tool Co., Ltd. 145	Macwhyte Company 9-
Armstrong-Bray & Company 158	Manitowoc Engineering Works 15:
Babcock & Wilcox Company 19	Martin Engineering Company 14
	Master Builders Company 149
Barber-Greene Company 91 Bemis Brothers Bag Company 18	Mixermobile Distributors 100 Multiplex Machinery Corporation 120
Berg Vault Company 158	
Besser Mfg. Company 150	Nagle Pumps, Inc. 114
Blaw-Knox Company 137	New Haven Vibrator Company 143
Boston Woven Hose &	Nordberg Manufacturing Company 24, 90
Rubber Company 14	Company 24, 90
Bucyrus Erie Company 152	
Bucyrus Eric Company	Oswalt Engineering
California Wire Cloth Corp. 110	Service Corp. 140
Caterpillar Tractor Company 5, 13	Pettibone Mulliken Corp. 103
Chain Belt Company 4, 128, 129	Toole mannen corp. 100
Chicago Pneumatic Tool Company 22	Quick Way Truck Shovel
Chrysler Corporation 99	Company 89
Colorado Fuel & Iron Corp. 110	Quinn Wire & Iron Works 158
Columbia-Geneva Steel Division 107	
Columbia Machine Works 148	Raymond Pulverizer Division 155
Combustion Engineering-	Republic Rubber Division 12
Superheater, Inc. 155	Resisto-Loy Company 157
Commercial Shearing &	Roebling's John A., Sons
Stamping Company 144	Company 17, 141
Concrete Pipe Machinery	Ryerson, Joseph T., & Son, Inc. 102
Company 142	St. Paul Hydraulic Hoist 35
Concrete Transport Mixer	Sauerman Brothers, Inc. 111
Company 145	Schield Bantam Company 109
Cook Brothers Equipment	Screen Equipment Co., Inc. 153
Company 139 Cross Engineering Company 159	Sheffield Steel Corporation 38
Cross Engineering Company 159	Smidth, F. L., & Company 32
Deister Machine Company 98	Smith Engineering Works 23
Denver Equipment Company 112, 113	Smith, T. L., & Company 118
Dodge Trucks 16	Spo Incorporated 144
DuPont, E. I., de Nemours	Smith, T. L., & Company 118 Spo Incorporated 144 Star Expansion Products
& Company 30, 31	Company 144
a company	Stearns Magnetic Inc. 96
Eagle Iron Works 36	Sterling Electric Motors 102
Ehrsam, J. B., & Sons 158	Stoody Company 87
Ehrsam, J. B., & Sons 158 Ellernan Company 156	Stoody Company 87 Stulz-Sickles Company 94 Syntron Company 100
Euclid Road Machinery Company 40	Syntron Company 100
D 1 1 D 1 C 100	
Farquahar, A. B., & Company 138	Tennessee Coal & Iron Division 107
Farrel-Bacon 113	Texas Company 46
Flexible Steel Lacing Company 159	Thermoid Company 25
Fuller Company 154	Towmotor Corporation 119
General Motors Corp. 26, 27	Trackson Company 5
Goodrich, B. F., & Company 3	Traylor Engineering & Mfg.
Goodyear Tire & Rubber	Company 7
Company 9, Back Cover	Union Bag & Paper Corp. 15
Gulf Oil Corporation 97	Union Wire Rope Corp. 108
	Unit Crane & Shovel Corp. 140
Hammond Bag & Paper Company 114	United States Steel Corp. 107, 116
Harnischfeger Ingide Back Cover	Universal Atlas Cement Company 116
Corp. Inside Back Cover	Universal Engineering Corp. 103
layward Company 111	Christian Magnicering Corp. 100
Hendrick Mfg. Co. 156	Western Machinery Company 28
aeger Machine Company 135	Wilfrey, A. R., & Sons, Inc. 112
	Wilfrey, A. R., & Sons, Inc. 112 Willard Concrete Machinery
aeger Machine Company 135 ohnson, C. S., & Company 132, 133 oy Manufacturing Company 101	
ohnson, C. S., & Company 132, 133 oy Manufacturing Company 101	Willard Concrete Machinery Company 143
ohnson, C. S., & Company 132, 133 oy Manufacturing Company 101 Gennedy-Van Saun Mfg. &	Willard Concrete Machinery Company 143
ohnson, C. S., & Company 132, 133 oy Manufacturing Company 101 Cennedy-Van Saun Mfg. & Engineering Corp. 10, 11	Willard Concrete Machinery Company 143 Williams, C. K., & Company 134
ohnson, C. S., & Company 132, 133 loy Manufacturing Company 101 Kennedy-Van Saun Mfg. & Engineering Corp. 10, 11 Kent Machine Company 142	Willard Concrete Machinery Company 143 Williams, C. K., & Company 134 Williams Patent Crusher &
ohnson, C. S., & Company 132, 133 oy Manufacturing Company 101 Cennedy-Van Saun Mfg. & Engineering Corp. 10, 11	Willard Concrete Machinery Company 143 Williams, C. K., & Company 134 Williams Patent Crusher & Pulverizer Company

# Tonnage



**ELECTRIC SHOVELS** 

In more and more locations these ultra-modern P&H machines are taking over the jobs that call for big production - steady digging. Users who know their cost accounting come back for more - for one proved reason . . . lower tonnage costs.

Contributing factors are these:

P&H Magnetorque\* Hoist Drive powers hoisting motions electro-magnetically, gives you snappier dipper action eliminates hoist generator, slip friction clutch and other troublesome mechanical devices.

P&H stepless power regulation is smooth and accurate with no control fingers or contactors to give you trouble. Independent propel, all-welded construction, filtered air cab and other modern refinements have led the way to more dependable production on a year-in, year-out basis.

If you seek lower tonnage costs in open pit work, let us tell you where you can see a P&H Electric Shovel in action. Ask about a P&H today.

\*T.M. of Harnischfeger Corporation for electro-magnetic type clutch

4465 West National Avenue • Milwaukee 46, Wisconsin



Every third P& 74 Electric Shovel sold is a repeat order

# 26 Times the service

# powering blast hole drill rig

Best service ever recorded by ordinary transmission belts, even with continuous attention and maintenance, was 4 to 6 weeks, due to severe pulsating overloads, dust and shocks.

The G.T. M. — Goodyear Technical Man — recommended using Compass Cord belt, with single plane of cords in load-carrying section of the belt. First belt has been on drive more than 3 years—without any attention at all. After 26 times the service of previous belts, this Compass belt looks good as new.



GOODFYEAR

THE GREATEST NAME IN RUBBER







# \*STAR THREADED SOCKETS

Specially designed inserts for the precast concrete

Sturdy, non-corrosive metal, perfect threaded units, positive anchorage.

Special Assemblies for Park Benches, Steps, Fence Posts, Vaults, Septic Tanks and other concrete products.

STAR EXPANSION PRODUCTS COMPANY

149 Cedar St. New York 6, N. Y.



WRITE for complete description, installation data and sizes -ENGINEERING COMPANY KEWANEE 4, ILLINOIS

do it more efficiently.

requirements, there's a Peterson VIBROLATOR to fit the job and

and hoppers when you use the patented Peterson pneu-

matic VIBROLATOR.